ORIGIN OF CYCLICAL FLUCTUATIONS IN ECONOMETRIC MODELS:

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CONTENTS

1. INTRODUCTION

This paper is a contribution to the analysis of stochastic dynamics of linear econometric models. Two topics concerning the cyclical components of the endogenous variables are considered:

Recent publications deal with the problem of neglecting the influence of the disturbance terms on endogenous variables in econometric models [4], [9], [10] . Their main point is to show that additional cycles are often generated in econometric models by the autoregressive transformation of the error variables which are not taken into account in the procedure of forecasting. In this paper these investigations are extended and the relative magnitude of the neglected error influence with reference to the endogenous variables is demonstrated. As an example a modified Klein I model for the U.S. economy with a sample period from 1921 to 1967 is used.

The second question of interest concerns the business cycle component of the endogenous variables. Another reason for its origin is the business cycle of the exogenous variables and their transformation by the econometric model, respectively. Investigations can be made as to which exogenous variables generate business cycle components of extraordinary magnitude and whether they have a compensating effect on each other. This question is of a special relevance from the point of view of economic policy because of the potential

dampening effect exerted by the instrumental variables.

The mathematical instrument for this research is the theory of linear transformations of stationary processes in the frequency domain. We partition the auto spectrum of the stationary part of the endogenous variables (which contains among others the business cycle) and analyse the components with respect to their origin by the exogenous variables and error terms, respectively.

Strictly speaking the theory of stationary processes can be applied only to the forecast with the exogenous variables alone (i.e. without taking into consideration the correlation structure of the error process). It shall be shown, however, that this forecast approaches relatively soon the forecast with the reduced form, usually applied in econometrics.

As we do not deal here with the statistical aspect of the problem we assume the estimated parameters of the model and of the exogenous process to be "true".

2. THE ECONOMETRIC MODEL AND ITS FINAL FORM

We deal with the standard linear econometric model

$$\sum_{n=0}^{k} B_n y_{t-n} = \sum_{m=0}^{h} \Gamma_m x_{t-m} + u_t \qquad (1)$$

where we denote by

- (y_t) the r-dimensional process of endogenous variables,
- (x_t) the s-dimensional process of exogenous variables,
- (u_t) the r-dimensional disturbance process,
- B_n (r.r) endogenous coefficient matrices,
- Γ_m (r.s) exogenous coefficient matrices,

and take the usual a-priori assumptions, especially

(i) stability, that is the roots of the equation

$$\det \left(\sum_{n=0}^{k} B_n z^n\right) = 0 \qquad (2)$$

are all to be found outside the unit circle,

(ii) exogenous and disturbance variables are uncorrelated,

$$Ex_s u_t' = 0 \text{ for all } s, t \in Z, \qquad (3)$$

(iii) (u_t) is stationary and $Eu_t = 0$.

Additionally often is supposed that

$$Eu_t u_t' = \begin{cases} \Sigma & \text{for } s=t, \text{ independent of } t, \\ 0 & \text{otherwise.} \end{cases} \tag{4}$$

For the reduced form we get the following equation:

$$y_t = -B_o^{-1}\left(\sum_{n=1}^{k} B_n y_{t-n}\right) + B_o^{-1}\left(\sum_{m=0}^{h} \Gamma_m x_{t-m}\right) + B_o^{-1} u_t \,. \tag{5}$$

Defining the lag operator L by $L(z_t)=(z_{t-1})$ we can write the solution of (1) in what is called the final form of the model:

$$y_t = \left(\sum_{n=0}^{k} B_n L^n\right)^{-1} \left(\sum_{m=0}^{h} \Gamma_m L^m\right) x_{t-m} + u_t \,. \tag{6}$$

Because of the stability condition $\left(\sum_{n=0}^{k} B_n L^n\right)^{-1}$ exists and has the follwing representation

$$\left(\sum_{n=0}^{k} B_n L^n\right)^{-1} = \sum_{n=0}^{\infty} A_n z^n \,. \tag{7}$$

The (r.r) matrices A_n are determined by the inversion of the complex matrix polynomial $P(z) = \sum_{n=0}^{k} B_n z^n$ which is defined for $|z| = 1$ (cf. [1], [3]):

$$\left(\sum_{n=0}^{k} B_n z^n\right)^{-1} = \sum_{n=0}^{\infty} A_n z^n \,. \tag{8}$$

The inversion of a matrix polynomial is defined analogous to a real matrix:

$$(P(z))^{-1} = \frac{1}{\det P(z)} \operatorname{adj} P(z) \; . \tag{9}$$

As adj $P(z)$ again constitutes a matrix polynomial the infinite number of A_n matrices in (8) is only caused by

$$\frac{1}{\det P(z)} \; .$$

As det $P(z)$ can be represented according to the fundamental theorem of algebra by

$$\det P(z) = \prod_{i=1}^{j} (z-\lambda_i) \tag{10}$$

with λ_i being the roots of (2). From

$$\frac{1}{(z-\lambda_i)} = \frac{}{1 - \frac{z}{\lambda_i}} = - \frac{1}{\lambda_i} \sum_{n=0}^{\infty} (\frac{z}{\lambda_i})^n \tag{11}$$

we recognize geometric convergence with the convergence velocity determined by

$$z_o = \max_i \left\{ \frac{1}{|\lambda_i|} \; , \; i=1,\ldots,j \right\} \; .$$

This assures convergence in quadratic mean for stochastic processes with (noncentral) second moments increasing with lower order than z_o^t .

3. FORECASTS WITHOUT TAKING INTO ACCOUNT THE CORRELATION STRUCTURE OF THE TRANSFORMED DISTURBANCE PROCESS

We assume that there is a sufficient long realization of the exogenous process available [1]. Thus the forecasting problem becomes a problem of conditional forecasting for given exogenous variables. If we don't take into account the correlation structure of the disturbance process we obtain our predictor from (6) as

$$y_{x,t} = \left(\sum_{n=0}^{k} B_n L^n\right)^{-1} \left(\sum_{m=0}^{h} \Gamma_m L^m\right) x_t \quad . \tag{12}$$

The prediction error is obtained as

$$y_{u,t} = \left(\sum_{n=0}^{k} B_n L^n\right)^{-1} u_t \quad . \tag{13}$$

Due to the assumption (i) and (iii) $(y_{u,t})$ is a stationary process.

Furthermore we assume the exogenous variables to be a stochastic process of the form [2]

$$x_t^i = a_i + b_i t + \bar{x}_t^i \quad , \quad i=1,\ldots,s \quad , \tag{14}$$

with $(\bar{x}_t)$ being a stationary process and $E\bar{x}_t = 0$.

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[1] This assumption, though widely used in econometrics, is strictly speaking only valid for instrumental variables. The data variables must be predicted from past realizations.

(14) constitutes a very common partitioning of economic time series into a long term growth component and a stationary process consisting e.g. of business cycle, seasonal, and disturbance components.

Due to (6) the process of endogenous variables can be written under assumption (14) as

$$y_t = \sum_{n=0}^{\infty} C_n a + \left(\sum_{n=0}^{\infty} C_n L^n b\right) t +$$

$$+ \left(\sum_{n=0}^{k} B_n e^{-i\lambda n}\right)^{-1} \left(\sum_{m=0}^{h} \Gamma_m e^{-i\lambda m}\right) e^{i\lambda t} dZ_x(\lambda) +$$

$$+ \left(\sum_{n=0}^{k} B_n e^{-i\lambda n}\right)^{-1} e^{i\lambda t} dZ_u(\lambda) =$$

$$= c + dt + y_{\bar{x},t} + y_{u,t} \qquad (15)$$

with

$$a = (a_i)_{i=1,\ldots,s}\ , \qquad (16a)$$

$$b = (b_i)_{i=1,\ldots,s}\ , \qquad (16b)$$

$$\sum_{n=0}^{\infty} C_n L^n = \left(\sum_{n=0}^{k} B_n L^n\right)^{-1} \left(\sum_{m=0}^{h} \Gamma_m L^m\right)\ , \qquad (16c)$$

2/ This assumption is introduced to apply the spectral theory of stationary processes to the cyclical components of the exogenous process. The deterministic mean value function of course need not be assumed to be linear.

$$\bar{x}_t = \int_{-\pi}^{\pi} e^{i\lambda t} dZ_x(\lambda) \ , \tag{16d}$$

$$u_t = \int_{-\pi}^{\pi} e^{i\lambda t} dZ_u(\lambda) \ , \tag{16e}$$

$$c = \sum_{n=0}^{\infty} C_n a \ , \tag{16f}$$

$$d = \sum_{n=0}^{\infty} C_n L^n b \ , \tag{16g}$$

$$(y_{\bar{x},t}) = (\sum_{n=0}^{\infty} C_n L^n)\ (\bar{x}_t) \ , \tag{16h}$$

$$(y_{u,t}) = (\sum_{n=0}^{\infty} A_n L^n)\ (u_t) \ . \tag{16i}$$

For the deterministic part of (15) only the linearity of the operator has been utilized. For the stochastic part the results of the spectral theory of stationary processes have been applied [1], [12]. In (15) we find a partition of the endogenous variables y_t into a part $(c + dt + y_{\bar{x},t})$ forecast by the exogenous variables and a part $y_{u,t}$ resulting from the disturbance.

4. ANALYSIS OF CYCLICAL FLUCTUATIONS

The cyclical components of the endogenous variables we get from the corresponding frequency band of their stationary part $(\bar{y}_t) = (y_{\bar{x},t}) + (y_{u,t})$. For economic reasons the business cycle frequency band with periods of about 4 to 5 years is of special interest. Basically there exist four possibilities of how cyclical fluctuations of the endogenous variables can be generated in econometric models.

(i) By the cyclical fluctuations of the exogenous variables. Their magnitude can be read from the main diagonal elements of the spectral matrix $f_{\bar{x}}$ of the process $(\bar{x}_t)$.

(ii) By the transformation $(\sum_{n=0}^{k} B_n L^n)^{-1}(\sum_{m=0}^{h} \Gamma_m L^m)$ of the exogenous variables in the model.

(iii) By the cyclical fluctuations of the disturbance process. If, however, we maintain assumption (4) there is no dominant frequency band.

(iv) By the transformation $(\sum_{n=0}^{k} B_n L^n)^{-1}$ of the disturbance process.

The cyclical components of the endogenous variables resulting from the above four sources are determined by their interplay. The phase of the process $(y_{\bar{x},t})$ and $(y_{u,t})$ is determined by assumption (3). Therefore we obtain for the autospectrum of the stationary part

of the endogenous variables:

$$f_{\bar{y}} = f_{y\bar{x}} + f_{yu} \tag{17}$$

with $f_{y\bar{x}}$ being the autospectrum of $(y_{\bar{x},t})$ and f_{yu} being the autospectrum of $(y_{u,t})$.

The spectral matrices $f_{y\bar{x}}$ and f_{yu} are determined by the transfer functions

$$B(\lambda) = \sum_{n=0}^{k} B_n e^{-i\lambda n} , \tag{18a}$$

$$\Gamma(\lambda) = \sum_{m=0}^{h} \Gamma_m e^{-i\lambda m} . \tag{18b}$$

The (estimated) spectral matrix $f_{\bar{y}}$ results in the general case with f_u being the autospectrum of (u_t) as

$$f_{yu}(\lambda) = B^{-1}(\lambda)\, f_u(\lambda)\, B^{-1*}(\lambda) \quad 3/ \tag{19a}$$

and under assumption (4) as

$$f_{yu}(\lambda) = \frac{1}{2\pi} B^{-1}(\lambda) \Sigma\, B^{-1*}(\lambda) \tag{19b}$$

and as

$$f_{y\bar{x}}(\lambda) = B^{-1}(\lambda)\, \Gamma(\lambda)\; f_{\bar{x}}(\lambda)\, \Gamma(\lambda)^{*}\, B^{-1*}(\lambda). \tag{19c}$$

3/ * denotes the conjugate transpose.

We are interested now to answer the following two questions:

(i) Which share in the variance of the i-th endogenous variable (y_t^i) is accounted for by the exogenous process, both generally and in particular at certain frequency bands ?

This can be seen from

$$\frac{E(y^i_{x,t})^2}{E(y^i_t)^2} = \frac{(c + dt)^2 + E(y_{\bar{x},t})^2}{(c + dt)^2 + E(y_{\bar{x},t})^2 + E(y_{u,t})^2} \quad , \quad (20)$$

which shows dependence on time, and the multiple coherence between the processes $(\bar{x}_t)$ and $(\bar{y}^i_t)$ (cf. [2]):

$$C_i^2 = \frac{f_{y^i_{\bar{x}}}}{f_{y^i_{\bar{x}}} + f_{y^i_u}} \quad . \quad (21)$$

(ii) Which influence exert the various exogenous variables on a particular cycle, e.g. the business cycle, of the i-th endogenous variable (y^i_t) ? Has one class of exogenous variables (denoted by class II), for example the instrumental variables, a stabilizing effect on the fluctuations corresponding to this particular cycle which are generated by another class of variables (denoted by class I), e.g. the noncontrolled exogenous variables ?

The second question shall now be investigated by partitioning the autospectrum of $y_{\bar{x}}^{i}$

$$f_{y\bar{x},i,i} = \sum_{p=1}^{r} \sum_{s=1}^{r} t_{i,p}\, f_{\bar{x},p,s}\, t_{i,s}^{*} \qquad (22)$$

with

$$(t_{ij}(\lambda)) = T(\lambda) = B(\lambda)^{-1} \Gamma(\lambda) \; . \qquad (23)$$

We rearrange the matrix $f_{\bar{x}}$ according to the partitioning into the two classes

$$f_{\bar{x}} = \left[\begin{array}{c|c} \begin{array}{c}\text{class I}\\ r_1 \cdot r_1\end{array} & \begin{array}{c}\text{cross spectra}\\ K\end{array} \\ \hline K^{*} & \begin{array}{c}\text{class II}\\ r_2 \cdot r_2\end{array} \end{array}\right] \qquad (24)$$

and thus get for (22)

$$\begin{aligned} f_{y\bar{x},i,i} = & \sum_{p=1}^{r_1} \sum_{s=1}^{r_1} t_{i,p}\, f_{\bar{x},p,s}\, t_{i,s}^{*} + \\ & + \sum_{p=r_1+1}^{r} \sum_{s=r_1+1}^{r} t_{i,p}\, f_{\bar{x},p,s}\, t_{i,s}^{*} + \\ & + 2\,\mathrm{Re} \sum_{p=1}^{r_1} \sum_{s=r_1+1}^{r} t_{i,p}\, f_{\bar{x},p,s}\, t_{i,s}^{*} \; . \end{aligned} \qquad (25)$$

If we denote the first term of the right hand side of (25) by $f^{I}_{\bar{x},i,i}$ and the remaining terms by $f^{II}_{\bar{x},i,i}$ it becomes evident that the cyclical component corresponding to a particular frequency band of the i-th endogenous variable is stabilized by class II variables only if $f^{II}_{\bar{x},i,i}$ is negative.

4. FORECAST WITH TAKING INTO ACCOUNT THE PAST REALIZATION OF THE DISTURBANCE PROCESS

From formula (6) we see that forecasting the endogenous variables only by the exogenous variables is not optimal under the least squares criterion, because the correlation of the process $(y_{u,t})$ contains additional information about the future behavior. It is easily see that the "reduced form predictor" obtained by recursive substitution in the reduced form (5)

$$\hat{y}_{t,1} = -B_o^{-1}\Big[\Big(\sum_{n=1}^{k} B_n y_{t-n+1}\Big) + \Big(\sum_{m=0}^{h} \Gamma_m x_{t-m+1}\Big)\Big] \tag{26}$$

$$\hat{y}_{t,2} = -B_o^{-1}\Big[B_1 \hat{y}_{t,1} + \sum_{n=2}^{k} B_n y_{t-n+2} + \sum_{m=0}^{h} \Gamma_m x_{t-m+2}\Big]$$

is least squares optimal under assumption (4).

One can show without difficulty that the prediction error of the (steady state) (y_t) process could be

written in the form

$$y_{t+s} - \hat{y}_{t,s} = \sum_{n=0}^{s-1} A_n u_{t+s-n} , \quad s > 0, \tag{27}$$

and that the predictor can be written as

$$\hat{y}_{t,s} = \sum_{n=0}^{\infty} C_n x_{t+s-n} + \sum_{n=s}^{\infty} A_s u_{t+s-n} , \quad s > 0 . \tag{28}$$

The term

$$\sum_{n=s}^{\infty} A_n u_{t+s-n}$$

constitutes the difference to the forecast based on exogenous variables only. As we demonstrated in section 2 the matrices A_n converge geometrically with order $z^o = \max \{ 1/|\lambda_i| , i=1,\ldots,j \}$ to zero. Thus for increasing s the two methods of forecasting converge more and more and all the faster the smaller is z^o . This allows us to assume the prediction error process to be approximative stationary and to apply the results of the preceeding chapters to the reduced form predictor.

5. NUMERICAL CALCULATIONS

The following steps are required for the numerical calculations:

Step 1: From the time regressions of the exogenous variables we calculate the coefficients $a = (a_i)_{i=1,\ldots,s}$ and $b = (b_i)_{i=1,\ldots,s}$, as also the residuals which characterize the unobservable process $(\bar{x}_t)$. These residuals are used to calculate the spectral matrix $f_{\bar{x}}$.

Step 2: From the estimated coefficients of the model we calculate the transfer functions $B(\lambda)$ and $\Gamma(\lambda)$ and the spectral matrix f_u of the structural form error process (u_t). Using $B(\lambda)$, $\Gamma(\lambda)$, $f_{\bar{x}}$ and f_u we compute the spectral matrices $f_{y\bar{x}}$, f_{yu}, $f_{\bar{y}}$, and the coherency C_i^2.

The econometric model used in demonstrating these procedures is a modified Klein I model with an extended sample period ranging from 1921 to 1967.

Endogenous variables:

C private consumption
I net investment
W^p private wage bill
Y national income
P profits

Exogenous variables:

T business taxes
G government expenditures
W^g public wage bill
t time
D^W dummy variable for world war 2

Structural equations:

1. $C_t = .7067\ (W^p_t + W^g_t) + .2332\ (W^p_{t-1} + W^g_{t-1}) + .2239\ P_t - 26.4638\ D^W + 10.6767 + u_{C,t}$

2. $I_t = .6300\ I_{t-1} + .1983\ [(Y_t + T_t - W^g_t) - (Y_{t-1} + T_{t-1} - W^g_{t-1})] + .2540 + u_{I,t}$

3. $W^p_t = .4774\ (Y_t + T_t - W^g_t) + .1737\ (Y_{t-1} + T_{t-1} - W^g_{t-1}) + .1650\ t - 2.6578 + u_{W^p,t}$

4. $Y_t = C_t + I_t - T_t + G_t$

5. $P_t = Y_t - W^p_t - W^g_t$

Equations to detrend exogenous variables:

1. $W^g_t = .4995\ t + 5.5508$

2. $T_t = .3497\ t + 6.6258$

3. $G_t = 1.0499\ t + 13.1147$

It should be pointed out that the results of the numerical calculations contained in the following appendices are not claimed to be typical (in the sense of special spectral shapes) for all econometric models. We rather want to propose methods how to examine certain dynamic properties of econometric models.

The diagrams show that the model transformes the disturbance process such that the lower frequency bands are more amplified that the higher bands. The same results hold for the transformation of the exogenous variables. From the diagrams of the coherences we can judge how the forecasting error is distributed over the frequency bands.

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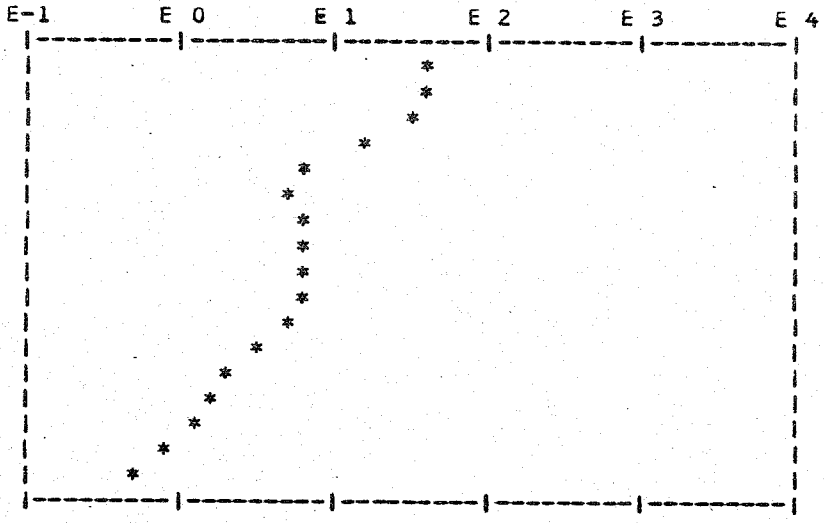
APPENDIX A:

Spectra of residuals

AUTO SPECTRA OF RESIDUALS

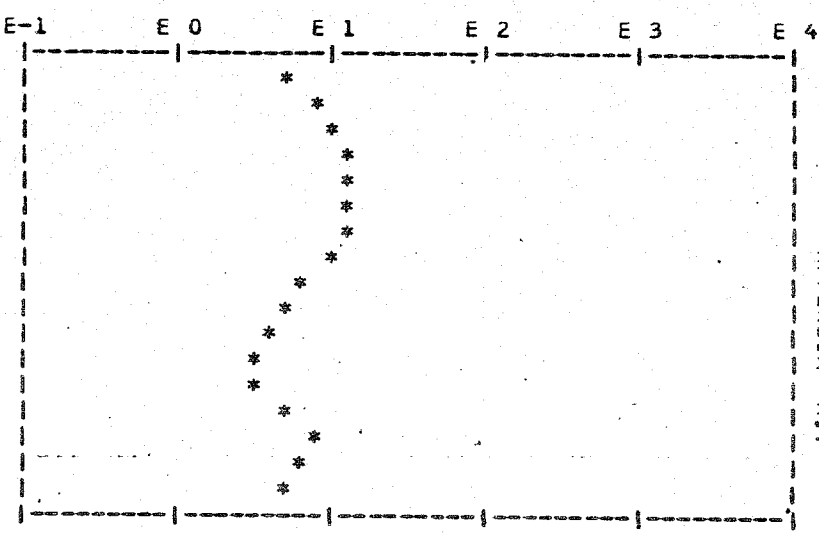
SERIES 1 C

I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.3931E 02	0.3931E 02	24.23	24.23
1	32.00	0.03	0.3712E 02	0.7643E 02	22.88	47.11
2	16.00	0.06	0.2708E 02	0.1035E 03	16.69	63.81
3	10.67	0.09	0.1353E 02	0.1170E 03	8.34	72.15
4	8.00	0.13	0.6104E 01	0.1231E 03	3.76	75.91
5	6.40	0.16	0.4379E 01	0.1275E 03	2.70	78.61
6	5.33	0.19	0.5145E 01	0.1327E 03	3.17	81.78
7	4.57	0.22	0.5780E 01	0.1384E 03	3.56	85.34
8	4.00	0.25	0.5375E 01	0.1438E 03	3.31	88.66
9	3.56	0.28	0.5233E 01	0.1491E 03	3.23	91.88
10	3.20	0.31	0.4807E 01	0.1539E 03	2.96	94.85
11	2.91	0.34	0.3127E 01	0.1570E 03	1.93	96.77
12	2.67	0.38	0.1627E 01	0.1586E 03	1.00	97.78
13	2.46	0.41	0.1290E 01	0.1599E 03	0.80	98.57
14	2.29	0.44	0.1123E 01	0.1610E 03	0.69	99.26
15	2.13	0.47	0.7024E 00	0.1617E 03	0.43	99.70
16	2.00	0.50	0.4912E 00	0.1622E 03	0.30	100.00



SERIES 2 I

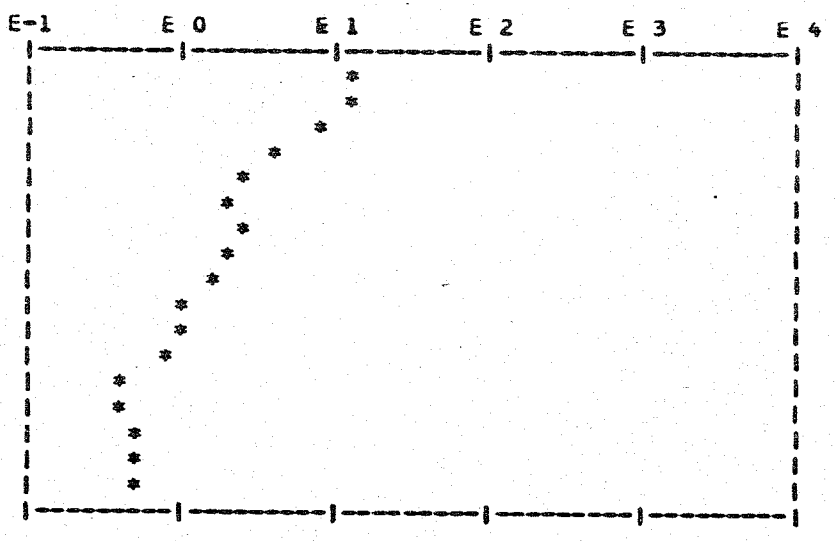
I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.4855E 01	0.4855E 01	4.17	4.17
1	32.00	0.03	0.6346E 01	0.1120E 02	5.45	9.62
2	16.00	0.06	0.9770E 01	0.2097E 02	8.39	18.01
3	10.67	0.09	0.1220E 02	0.3317E 02	10.48	28.49
4	8.00	0.13	0.1152E 02	0.4469E 02	9.90	38.38
5	6.40	0.16	0.1059E 02	0.5529E 02	9.10	47.48
6	5.33	0.19	0.1109E 02	0.6638E 02	9.53	57.01
7	4.57	0.22	0.9340E 01	0.7572E 02	8.02	65.03
8	4.00	0.25	0.5824E 01	0.8154E 02	5.00	70.03
9	3.56	0.28	0.4097E 01	0.8564E 02	3.52	73.55
10	3.20	0.31	0.3429E 01	0.8907E 02	2.94	76.49
11	2.91	0.34	0.2517E 01	0.9159E 02	2.16	78.65
12	2.67	0.38	0.2716E 01	0.9430E 02	2.33	80.99
13	2.46	0.41	0.4839E 01	0.9914E 02	4.16	85.14
14	2.29	0.44	0.6571E 01	0.1057E 03	5.64	90.79
15	2.13	0.47	0.5855E 01	0.1116E 03	5.03	95.81
16	2.00	0.50	0.4873E 01	0.1164E 03	4.19	100.00



AUTO SPECTRA OF RESIDUALS

SERIES 3 W1

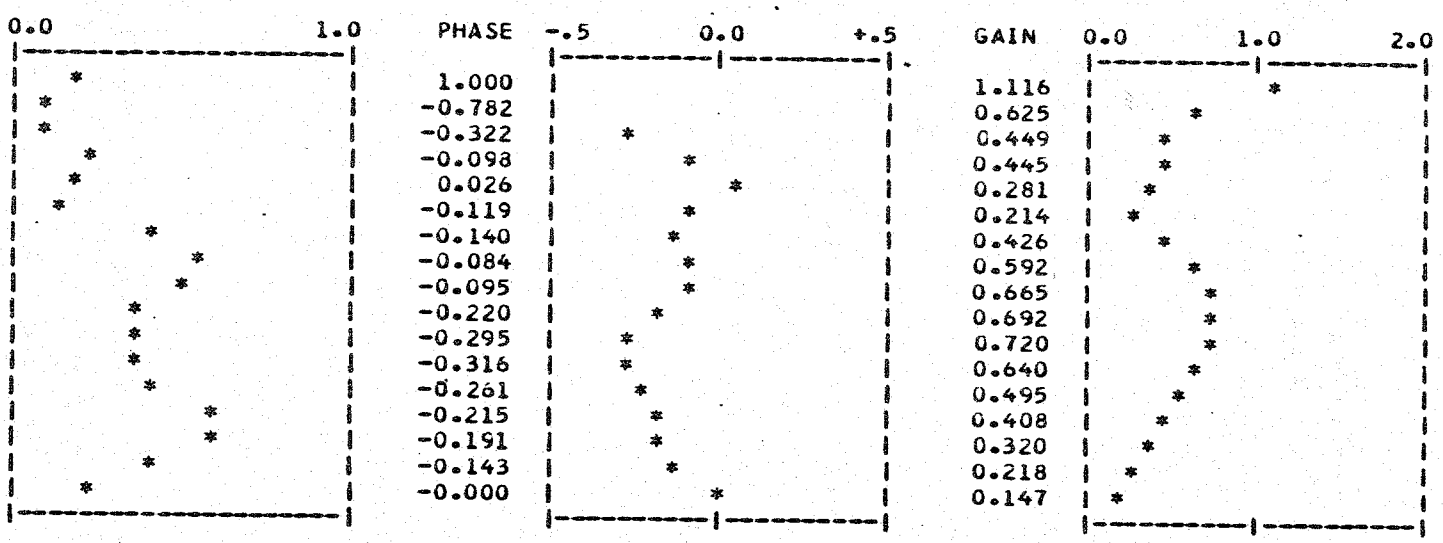
I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.1110E 02	0.1110E 02	23.34	23.34
1	32.00	0.03	0.1068E 02	0.2178E 02	22.46	45.80
2	16.00	0.06	0.7841E 01	0.2962E 02	16.49	62.29
3	10.67	0.09	0.3891E 01	0.3351E 02	8.18	70.47
4	8.00	0.13	0.2137E 01	0.3565E 02	4.50	74.96
5	6.40	0.16	0.1931E 01	0.3758E 02	4.06	79.02
6	5.33	0.19	0.2070E 01	0.3965E 02	4.35	83.38
7	4.57	0.22	0.1898E 01	0.4154E 02	3.99	87.37
8	4.00	0.25	0.1261E 01	0.4281E 02	2.65	90.02
9	3.56	0.28	0.9557E 00	0.4376E 02	2.01	92.03
10	3.20	0.31	0.9764E 00	0.4474E 02	2.05	94.09
11	2.91	0.34	0.7289E 00	0.4547E 02	1.53	95.62
12	2.67	0.38	0.3871E 00	0.4585E 02	0.81	96.43
13	2.46	0.41	0.3327E 00	0.4619E 02	0.70	97.13
14	2.29	0.44	0.4415E 00	0.4663E 02	0.93	98.06
15	2.13	0.47	0.4716E 00	0.4710E 02	0.99	99.05
16	2.00	0.50	0.4507E 00	0.4755E 02	0.95	100.00



CROSS SPECTRA OF RESIDUALS

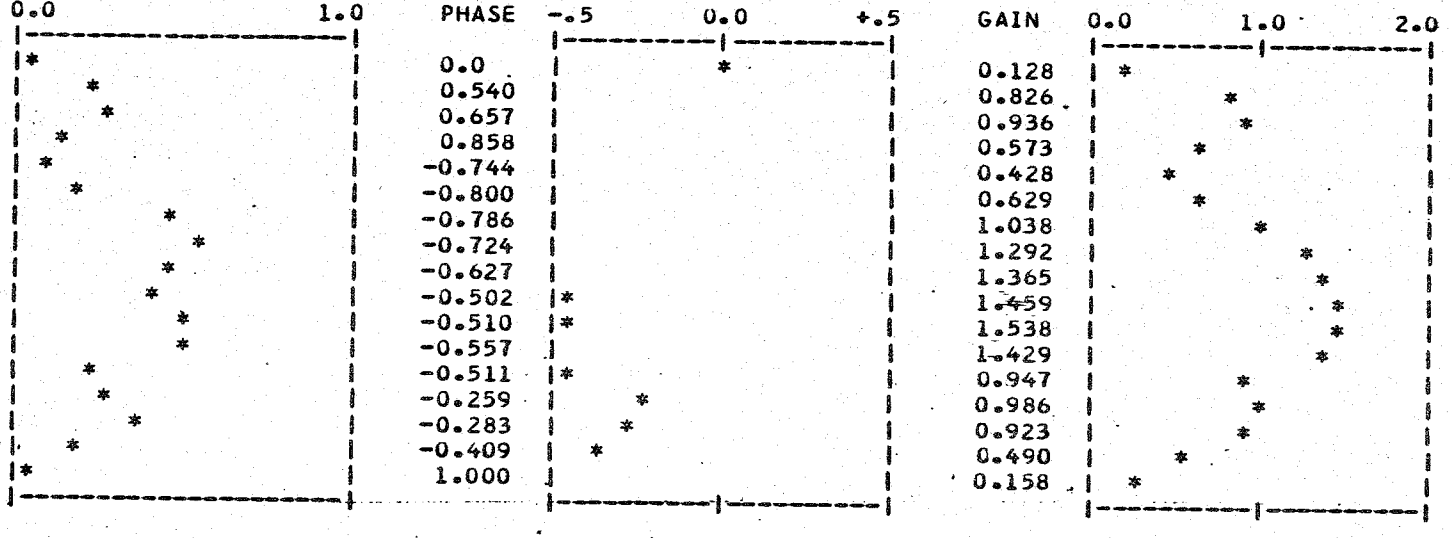
SERIES 1 C AND SERIES 2 I

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.154	1.000	1.116
1	32.00	0.03	0.067	-0.782	0.625
2	16.00	0.06	0.073	-0.322	0.449
3	10.67	0.09	0.179	-0.098	0.445
4	8.00	0.13	0.149	0.026	0.281
5	6.40	0.16	0.111	-0.119	0.214
6	5.33	0.19	0.391	-0.140	0.426
7	4.57	0.22	0.567	-0.084	0.592
8	4.00	0.25	0.479	-0.095	0.665
9	3.56	0.28	0.374	-0.220	0.692
10	3.20	0.31	0.369	-0.295	0.720
11	2.91	0.34	0.330	-0.316	0.640
12	2.67	0.38	0.409	-0.261	0.495
13	2.46	0.41	0.624	-0.215	0.408
14	2.29	0.44	0.599	-0.191	0.320
15	2.13	0.47	0.398	-0.143	0.218
16	2.00	0.50	0.214	-0.000	0.147



SERIES 1 C AND SERIES 3 W1

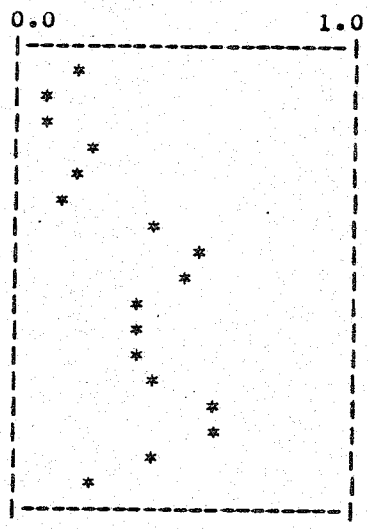
I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.005	0.0	0.128
1	32.00	0.03	0.196	0.540	0.826
2	16.00	0.06	0.254	0.657	0.936
3	10.67	0.09	0.094	0.858	0.573
4	8.00	0.13	0.064	-0.744	0.428
5	6.40	0.16	0.174	-0.800	0.629
6	5.33	0.19	0.433	-0.786	1.038
7	4.57	0.22	0.548	-0.724	1.292
8	4.00	0.25	0.437	-0.627	1.365
9	3.56	0.28	0.389	-0.502	1.459
10	3.20	0.31	0.481	-0.510	1.538
11	2.91	0.34	0.476	-0.557	1.429
12	2.67	0.38	0.213	-0.511	0.947
13	2.46	0.41	0.251	-0.259	0.986
14	2.29	0.44	0.335	-0.283	0.923
15	2.13	0.47	0.161	-0.409	0.490
16	2.00	0.50	0.023	1.000	0.158

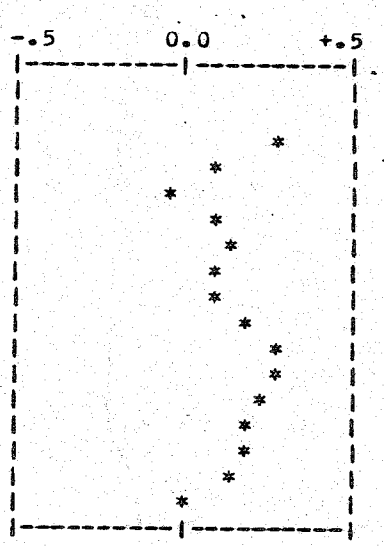


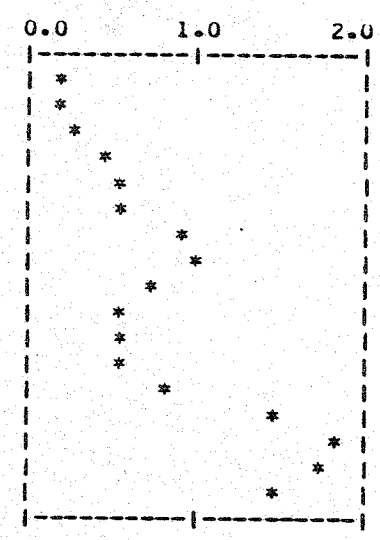
CROSS SPECTRA OF RESIDUALS

SERIES 2 I AND SERIES 1 C

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.154	-1.000	0.138
1	32.00	0.03	0.067	0.782	0.107
2	16.00	0.06	0.073	0.322	0.162
3	10.67	0.09	0.179	0.098	0.401
4	8.00	0.13	0.149	-0.026	0.530
5	6.40	0.16	0.111	0.119	0.518
6	5.33	0.19	0.391	0.140	0.918
7	4.57	0.22	0.567	0.084	0.957
8	4.00	0.25	0.479	0.095	0.721
9	3.56	0.28	0.374	0.220	0.541
10	3.20	0.31	0.369	0.295	0.513
11	2.91	0.34	0.330	0.316	0.516
12	2.67	0.38	0.409	0.261	0.826
13	2.46	0.41	0.624	0.215	1.530
14	2.29	0.44	0.599	0.191	1.873
15	2.13	0.47	0.398	0.143	1.821
16	2.00	0.50	0.214	0.000	1.457

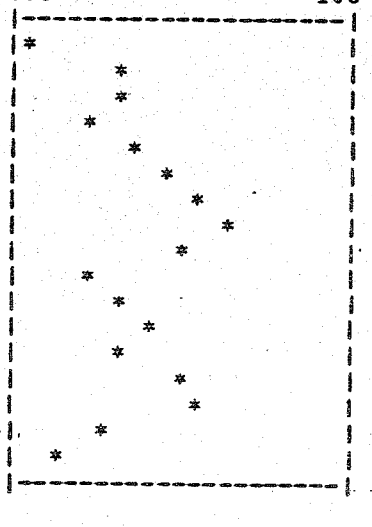


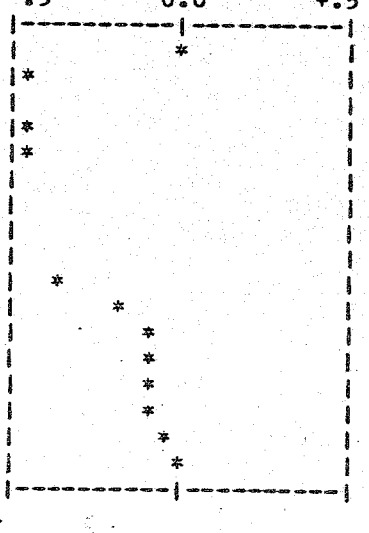


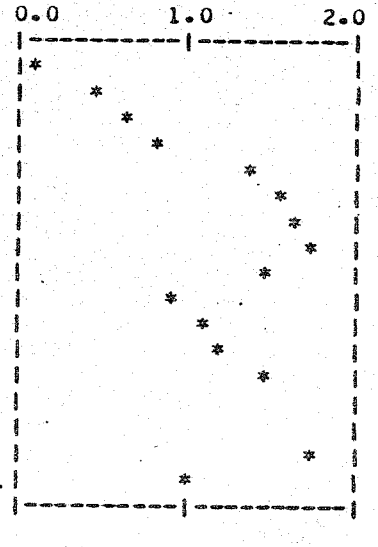


SERIES 2 I AND SERIES 3 W1

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.000	0.0	0.013
1	32.00	0.03	0.321	-0.516	0.437
2	16.00	0.06	0.289	-0.534	0.601
3	10.67	0.09	0.213	-0.520	0.817
4	8.00	0.13	0.342	-0.497	1.357
5	6.40	0.16	0.447	-0.547	1.566
6	5.33	0.19	0.536	-0.651	1.695
7	4.57	0.22	0.663	-0.690	1.807
8	4.00	0.25	0.520	-0.652	1.549
9	3.56	0.28	0.203	-0.399	0.932
10	3.20	0.31	0.316	-0.180	1.053
11	2.91	0.34	0.383	-0.116	1.150
12	2.67	0.38	0.313	-0.081	1.483
13	2.46	0.41	0.487	-0.094	2.660
14	2.29	0.44	0.526	-0.089	2.797
15	2.13	0.47	0.265	-0.070	1.813
16	2.00	0.50	0.094	-0.000	1.006







CROSS SPECTRA OF RESIDUALS

SERIES 3 W1 AND SERIES 1 C

I	T(I)	L(I)	COHERENCE
0	999.99	0.0	0.005
1	32.00	0.03	0.196
2	16.00	0.06	0.254
3	10.67	0.09	0.094
4	8.00	0.13	0.064
5	6.40	0.16	0.174
6	5.33	0.19	0.433
7	4.57	0.22	0.548
8	4.00	0.25	0.437
9	3.56	0.28	0.389
10	3.20	0.31	0.481
11	2.91	0.34	0.476
12	2.67	0.38	0.213
13	2.46	0.41	0.251
14	2.29	0.44	0.335
15	2.13	0.47	0.161
16	2.00	0.50	0.023

COHERENCE 0.0 — 1.0

PHASE
0.0
-0.540
-0.657
-0.858
0.744
0.800
0.786
0.724
0.627
0.502
0.510
0.557
0.511
0.259
0.283
0.409
-1.000

PHASE -.5 — 0.0 — +.5

GAIN
0.036
0.238
0.271
0.165
0.150
0.277
0.417
0.424
0.320
0.267
0.312
0.333
0.225
0.254
0.363
0.329
0.145

GAIN 0.0 — 1.0 — 2.0

SERIES 3 W1 AND SERIES 2 I

I	T(I)	L(I)	COHERENCE
0	999.99	0.0	0.000
1	32.00	0.03	0.321
2	16.00	0.06	0.289
3	10.67	0.09	0.213
4	8.00	0.13	0.342
5	6.40	0.16	0.447
6	5.33	0.19	0.536
7	4.57	0.22	0.663
8	4.00	0.25	0.520
9	3.56	0.28	0.203
10	3.20	0.31	0.316
11	2.91	0.34	0.383
12	2.67	0.38	0.313
13	2.46	0.41	0.487
14	2.29	0.44	0.526
15	2.13	0.47	0.265
16	2.00	0.50	0.094

COHERENCE 0.0 — 1.0

PHASE
0.0
0.516
0.534
0.520
0.497
0.547
0.651
0.690
0.652
0.399
0.180
0.116
0.081
0.094
0.089
0.070
0.000

PHASE -.5 — 0.0 — +.5

GAIN
0.029
0.735
0.482
0.261
0.252
0.285
0.316
0.367
0.335
0.218
0.300
0.333
0.211
0.183
0.188
0.146
0.093

GAIN 0.0 — 1.0 — 2.0

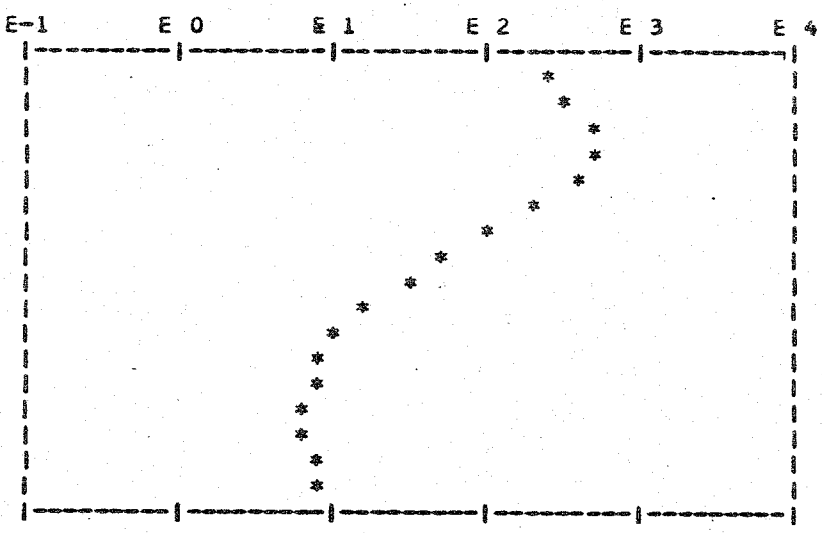
APPENDIX B:

Spectra of exogenous variables

AUTO SPECTRA OF EXOGENOUS VARIABLES

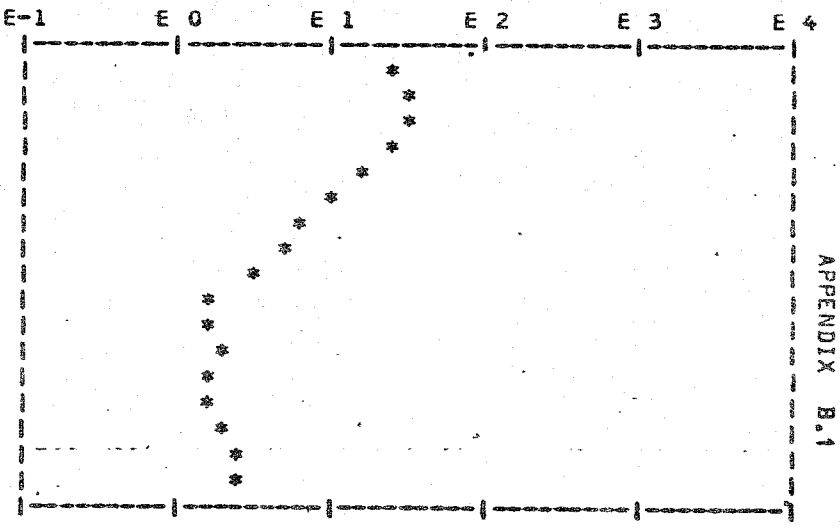
SERIES 1 G

I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.2104E 03	0.2104E 03	10.03	10.03
1	32.00	0.03	0.2932E 03	0.5036E 03	13.97	24.00
2	16.00	0.06	0.4247E 03	0.9283E 03	20.24	44.23
3	10.67	0.09	0.4403E 03	0.1369E 04	20.98	65.22
4	8.00	0.13	0.3267E 03	0.1695E 04	15.57	80.78
5	6.40	0.16	0.1806E 03	0.1876E 04	8.61	89.39
6	5.33	0.19	0.8724E 02	0.1963E 04	4.16	93.55
7	4.57	0.22	0.4717E 02	0.2010E 04	2.25	95.80
8	4.00	0.25	0.2622E 02	0.2037E 04	1.25	97.04
9	3.56	0.28	0.1365E 02	0.2050E 04	0.65	97.70
10	3.20	0.31	0.9021E 01	0.2059E 04	0.43	98.13
11	2.91	0.34	0.7545E 01	0.2067E 04	0.36	98.48
12	2.67	0.38	0.6511E 01	0.2073E 04	0.31	98.79
13	2.46	0.41	0.6001E 01	0.2079E 04	0.29	99.08
14	2.29	0.44	0.6100E 01	0.2085E 04	0.29	99.37
15	2.13	0.47	0.6503E 01	0.2092E 04	0.31	99.68
16	2.00	0.50	0.6684E 01	0.2099E 04	0.32	100.00



SERIES 2 T

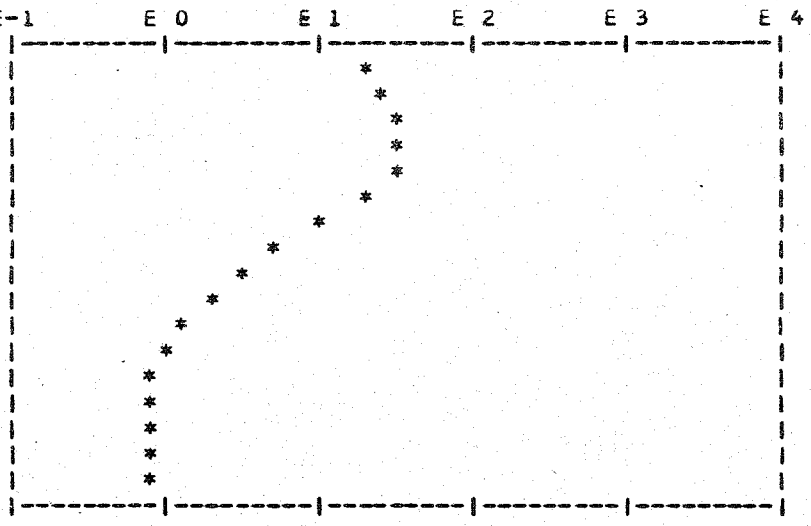
I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.2399E 02	0.2399E 02	16.19	16.19
1	32.00	0.03	0.2607E 02	0.5006E 02	17.59	33.78
2	16.00	0.06	0.2698E 02	0.7704E 02	18.21	51.98
3	10.67	0.09	0.2198E 02	0.9902E 02	14.83	66.82
4	8.00	0.13	0.1413E 02	0.1131E 03	9.53	76.35
5	6.40	0.16	0.8247E 01	0.1214E 03	5.56	81.91
6	5.33	0.19	0.5939E 01	0.1273E 03	4.01	85.92
7	4.57	0.22	0.4597E 01	0.1319E 03	3.10	89.02
8	4.00	0.25	0.2729E 01	0.1347E 03	1.84	90.86
9	3.56	0.28	0.1488E 01	0.1361E 03	1.00	91.87
10	3.20	0.31	0.1385E 01	0.1375E 03	0.93	92.80
11	2.91	0.34	0.1621E 01	0.1392E 03	1.09	93.90
12	2.67	0.38	0.1565E 01	0.1407E 03	1.06	94.95
13	2.46	0.41	0.1435E 01	0.1422E 03	0.97	95.92
14	2.29	0.44	0.1660E 01	0.1438E 03	1.12	97.04
15	2.13	0.47	0.2093E 01	0.1459E 03	1.41	98.45
16	2.00	0.50	0.2293E 01	0.1482E 03	1.55	100.00



AUTO SPECTRA OF EXOGENOUS VARIABLES

SERIES 3 M2

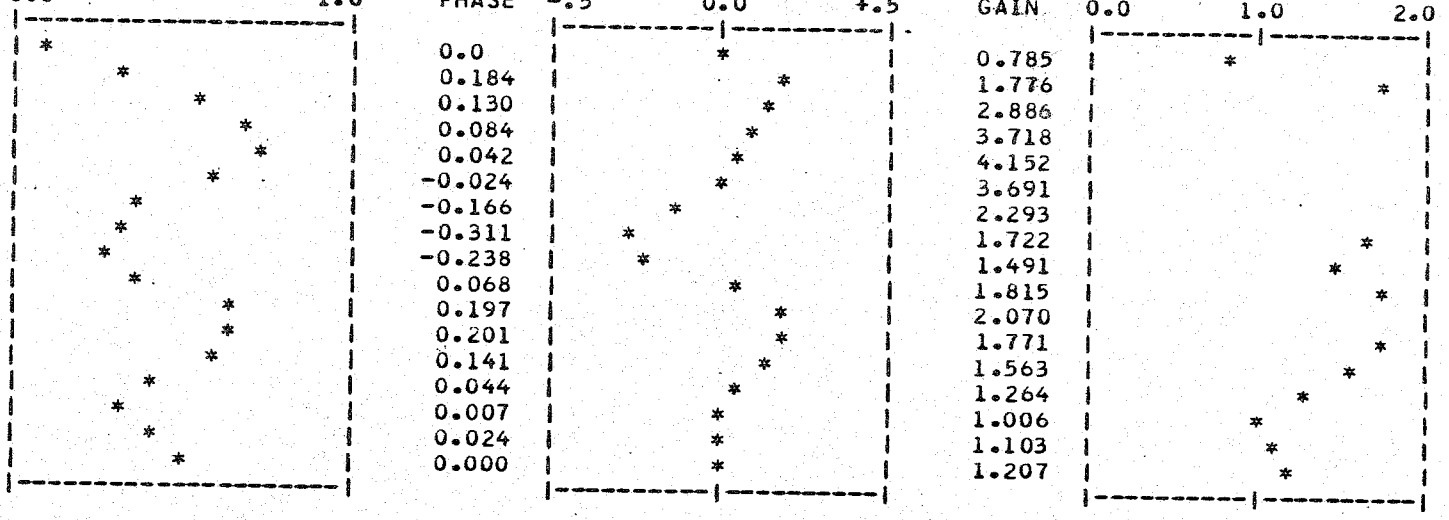
I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.1631E 02	0.1631E 02	9.92	9.92
1	32.00	0.03	0.2180E 02	0.3811E 02	13.27	23.19
2	16.00	0.06	0.3002E 02	0.6813E 02	18.26	41.45
3	10.67	0.09	0.3133E 02	0.9946E 02	19.06	60.51
4	8.00	0.13	0.2552E 02	0.1250E 03	15.52	76.03
5	6.40	0.16	0.1636E 02	0.1413E 03	9.95	85.99
6	5.33	0.19	0.8791E 01	0.1501E 03	5.35	91.33
7	4.57	0.22	0.4659E 01	0.1548E 03	2.83	94.17
8	4.00	0.25	0.2684E 01	0.1575E 03	1.63	95.80
9	3.56	0.28	0.1635E 01	0.1591E 03	0.99	96.80
10	3.20	0.31	0.1074E 01	0.1602E 03	0.65	97.45
11	2.91	0.34	0.8004E 00	0.1610E 03	0.49	97.94
12	2.67	0.38	0.6622E 00	0.1616E 03	0.40	98.34
13	2.46	0.41	0.6701E 00	0.1623E 03	0.41	98.75
14	2.29	0.44	0.7360E 00	0.1630E 03	0.45	99.19
15	2.13	0.47	0.6938E 00	0.1637E 03	0.42	99.62
16	2.00	0.50	0.6310E 00	0.1644E 03	0.38	100.00



CROSS SPECTRA OF EXOGENOUS VARIABLES

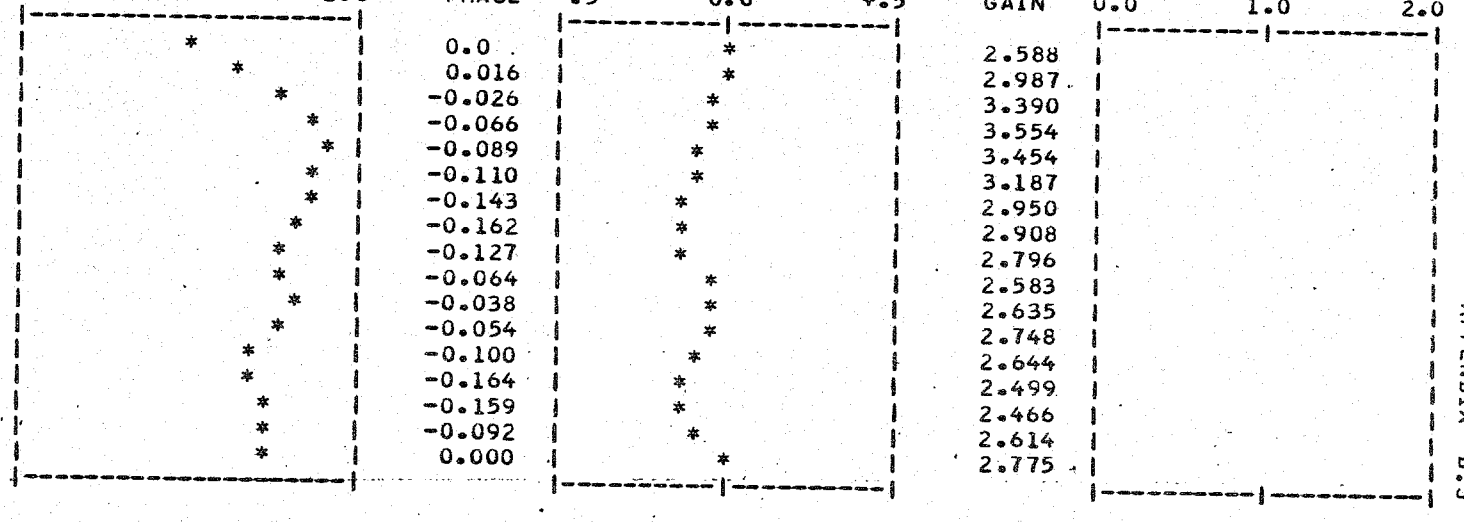
SERIES 1 G AND SERIES 2 T

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.070	0.0	0.785
1	32.00	0.03	0.280	0.184	1.776
2	16.00	0.06	0.529	0.130	2.886
3	10.67	0.09	0.690	0.084	3.718
4	8.00	0.13	0.746	0.042	4.152
5	6.40	0.16	0.622	-0.024	3.691
6	5.33	0.19	0.358	-0.166	2.293
7	4.57	0.22	0.289	-0.311	1.722
8	4.00	0.25	0.231	-0.238	1.491
9	3.56	0.28	0.359	0.068	1.815
10	3.20	0.31	0.658	0.197	2.070
11	2.91	0.34	0.674	0.201	1.771
12	2.67	0.38	0.587	0.141	1.563
13	2.46	0.41	0.382	0.044	1.264
14	2.29	0.44	0.275	0.007	1.006
15	2.13	0.47	0.391	0.024	1.103
16	2.00	0.50	0.500	0.000	1.207



SERIES 1 G AND SERIES 3 W2

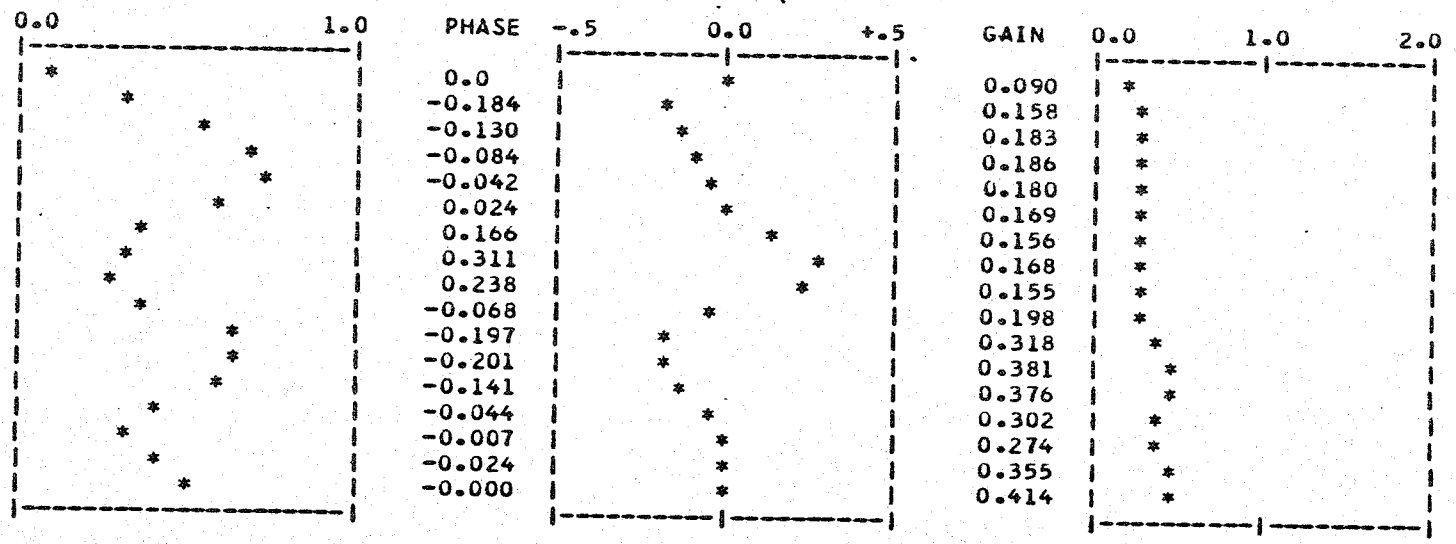
I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.519	0.0	2.588
1	32.00	0.03	0.664	0.016	2.987
2	16.00	0.06	0.812	-0.026	3.390
3	10.67	0.09	0.899	-0.066	3.554
4	8.00	0.13	0.932	-0.089	3.454
5	6.40	0.16	0.920	-0.110	3.187
6	5.33	0.19	0.877	-0.143	2.950
7	4.57	0.22	0.835	-0.162	2.908
8	4.00	0.25	0.800	-0.127	2.796
9	3.56	0.28	0.799	-0.064	2.583
10	3.20	0.31	0.827	-0.038	2.635
11	2.91	0.34	0.801	-0.054	2.748
12	2.67	0.38	0.711	-0.100	2.644
13	2.46	0.41	0.697	-0.164	2.499
14	2.29	0.44	0.734	-0.159	2.466
15	2.13	0.47	0.729	-0.092	2.614
16	2.00	0.50	0.727	0.000	2.775



CROSS SPECTRA OF EXOGENOUS VARIABLES

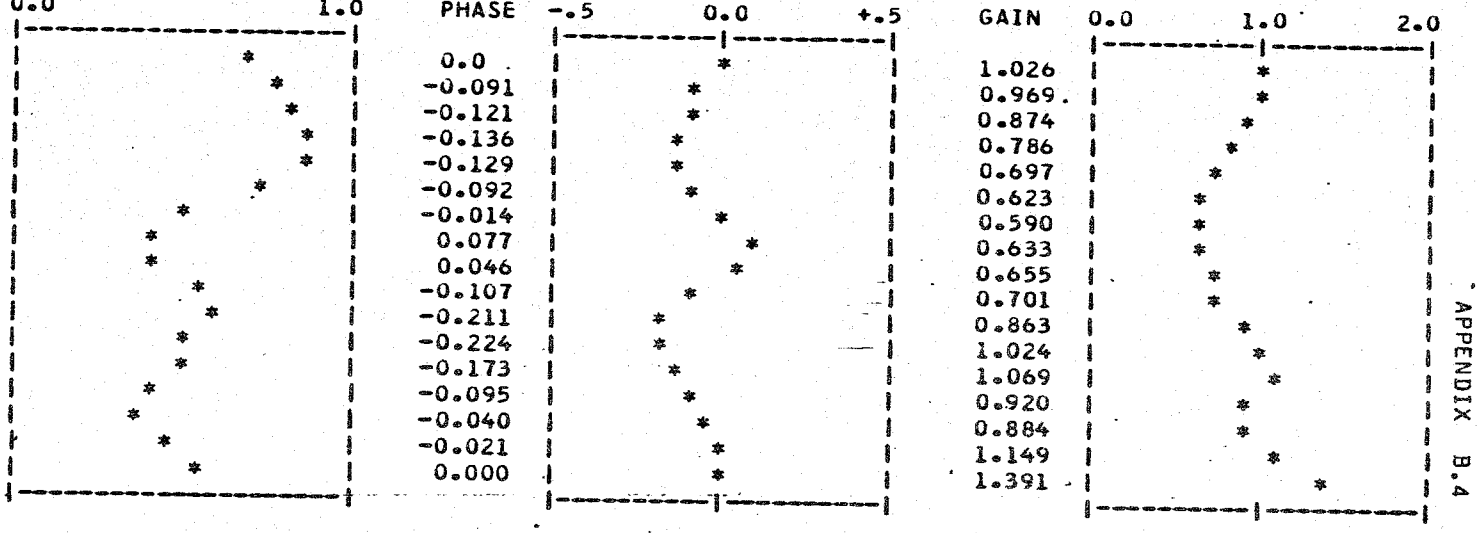
SERIES 2 T AND SERIES 1 G

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.070	0.0	0.090
1	32.00	0.03	0.280	-0.184	0.158
2	16.00	0.06	0.529	-0.130	0.183
3	10.67	0.09	0.690	-0.084	0.186
4	8.00	0.13	0.746	-0.042	0.180
5	6.40	0.16	0.622	0.024	0.169
6	5.33	0.19	0.358	0.166	0.156
7	4.57	0.22	0.289	0.311	0.168
8	4.00	0.25	0.231	0.238	0.155
9	3.56	0.28	0.359	-0.068	0.198
10	3.20	0.31	0.658	-0.197	0.318
11	2.91	0.34	0.674	-0.201	0.381
12	2.67	0.38	0.587	-0.141	0.376
13	2.46	0.41	0.382	-0.044	0.302
14	2.29	0.44	0.275	-0.007	0.274
15	2.13	0.47	0.391	-0.024	0.355
16	2.00	0.50	0.500	-0.000	0.414



SERIES 2 T AND SERIES 3 42

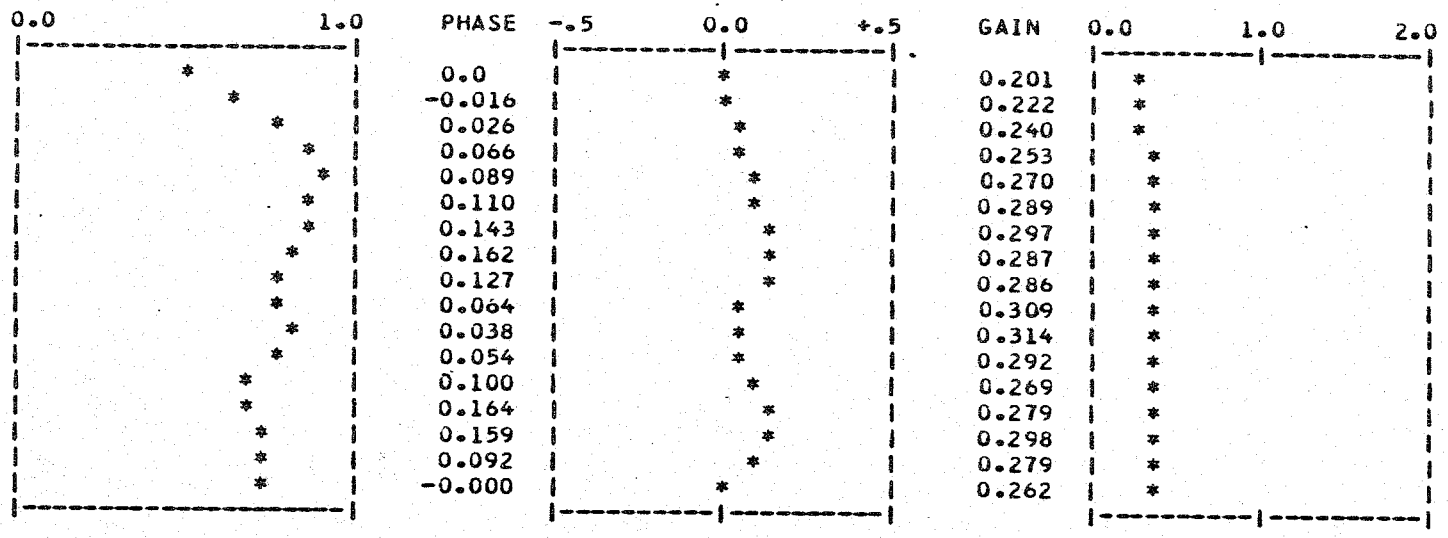
I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.716	0.0	1.026
1	32.00	0.03	0.786	-0.091	0.969
2	16.00	0.06	0.850	-0.121	0.874
3	10.67	0.09	0.881	-0.136	0.786
4	8.00	0.13	0.878	-0.129	0.697
5	6.40	0.16	0.770	-0.092	0.623
6	5.33	0.19	0.515	-0.014	0.590
7	4.57	0.22	0.406	0.077	0.633
8	4.00	0.25	0.421	0.046	0.655
9	3.56	0.28	0.540	-0.107	0.701
10	3.20	0.31	0.577	-0.211	0.863
11	2.91	0.34	0.518	-0.224	1.024
12	2.67	0.38	0.484	-0.173	1.069
13	2.46	0.41	0.395	-0.095	0.920
14	2.29	0.44	0.346	-0.040	0.884
15	2.13	0.47	0.437	-0.021	1.149
16	2.00	0.50	0.532	0.000	1.391



CROSS SPECTRA OF EXOGENOUS VARIABLES

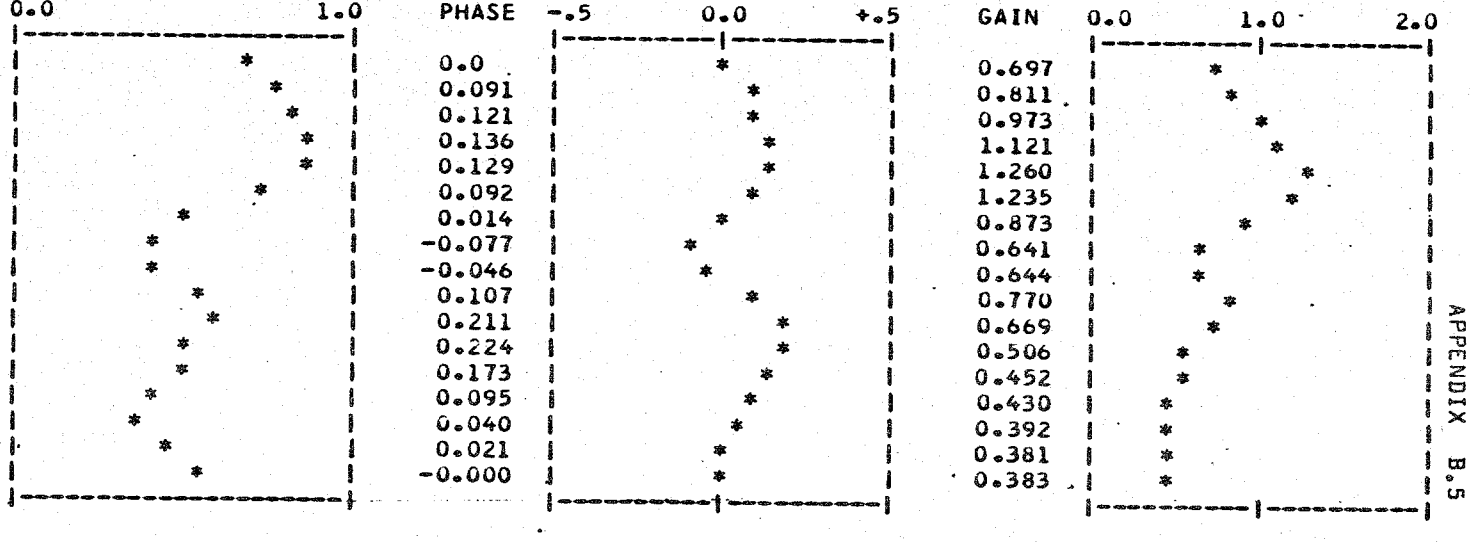
SERIES 3 w2 AND SERIES 1 G

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.519	0.0	0.201
1	32.00	0.03	0.664	-0.016	0.222
2	16.00	0.06	0.812	0.026	0.240
3	10.67	0.09	0.899	0.066	0.253
4	8.00	0.13	0.932	0.089	0.270
5	6.40	0.16	0.920	0.110	0.289
6	5.33	0.19	0.877	0.143	0.297
7	4.57	0.22	0.835	0.162	0.287
8	4.00	0.25	0.800	0.127	0.286
9	3.56	0.28	0.799	0.064	0.309
10	3.20	0.31	0.827	0.038	0.314
11	2.91	0.34	0.801	0.054	0.292
12	2.67	0.38	0.711	0.100	0.269
13	2.46	0.41	0.697	0.164	0.279
14	2.29	0.44	0.734	0.159	0.298
15	2.13	0.47	0.729	0.092	0.279
16	2.00	0.50	0.727	-0.000	0.262



SERIES 3 w2 AND SERIES 2 T

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.716	0.0	0.697
1	32.00	0.03	0.786	0.091	0.811
2	16.00	0.06	0.850	0.121	0.973
3	10.67	0.09	0.881	0.136	1.121
4	8.00	0.13	0.878	0.129	1.260
5	6.40	0.16	0.770	0.092	1.235
6	5.33	0.19	0.515	0.014	0.873
7	4.57	0.22	0.406	-0.077	0.641
8	4.00	0.25	0.421	-0.046	0.644
9	3.56	0.28	0.540	0.107	0.770
10	3.20	0.31	0.577	0.211	0.669
11	2.91	0.34	0.518	0.224	0.506
12	2.67	0.38	0.484	0.173	0.452
13	2.46	0.41	0.395	0.095	0.430
14	2.29	0.44	0.346	0.040	0.392
15	2.13	0.47	0.437	0.021	0.381
16	2.00	0.50	0.532	-0.000	0.383



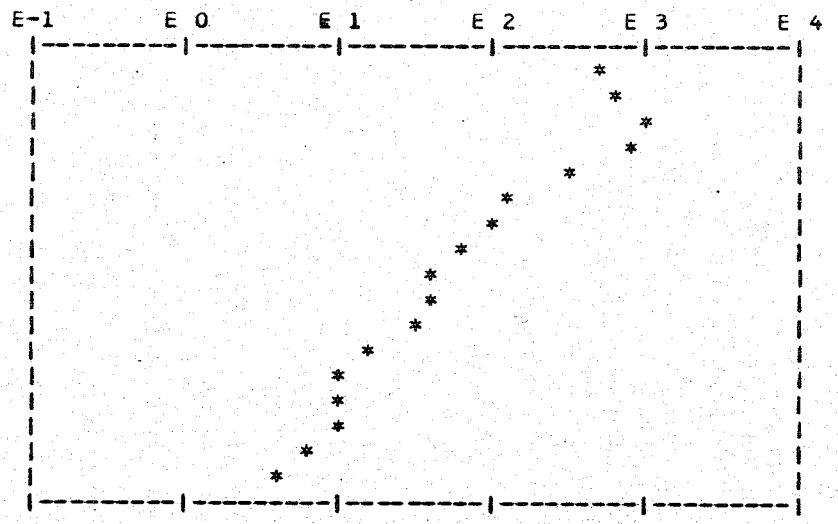
APPENDIX C:

Spectra of endogenous variables generated by residuals

AUTO SPECTRA OF ENDOG. VAR. GENERATED BY RESIDUALS

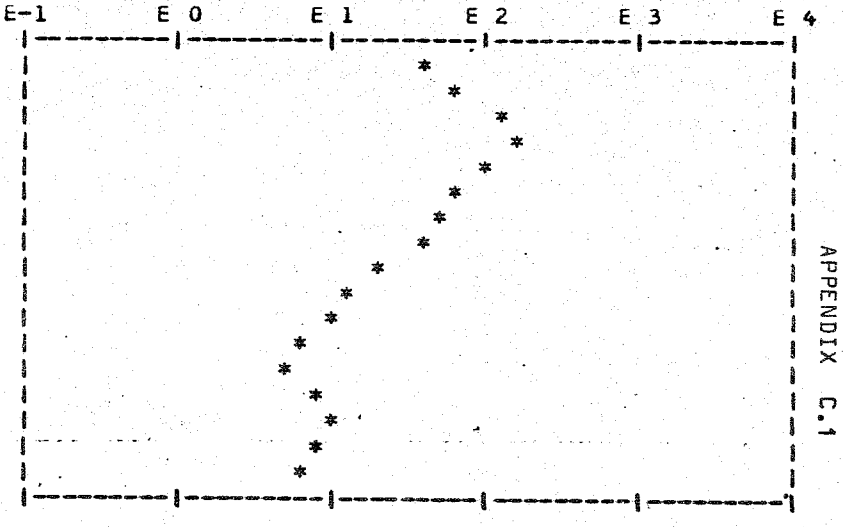
SERIES 1 C

I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.4590E 03	0.4590E 03	14.27	14.27
1	32.00	0.03	0.5799E 03	0.1039E 04	18.03	32.30
2	16.00	0.06	0.8373E 03	0.1876E 04	26.03	58.34
3	10.67	0.09	0.6715E 03	0.2548E 04	20.88	79.21
4	8.00	0.13	0.2628E 03	0.2810E 04	8.17	87.39
5	6.40	0.16	0.1165E 03	0.2927E 04	3.62	91.01
6	5.33	0.19	0.8593E 02	0.3013E 04	2.67	93.68
7	4.57	0.22	0.5841E 02	0.3071E 04	1.82	95.50
8	4.00	0.25	0.3885E 02	0.3110E 04	1.21	96.70
9	3.56	0.28	0.3237E 02	0.3143E 04	1.01	97.71
10	3.20	0.31	0.2579E 02	0.3168E 04	0.80	98.51
11	2.91	0.34	0.1476E 02	0.3183E 04	0.46	98.97
12	2.67	0.38	0.8235E 01	0.3191E 04	0.26	99.23
13	2.46	0.41	0.8439E 01	0.3200E 04	0.26	99.49
14	2.29	0.44	0.8147E 01	0.3208E 04	0.25	99.74
15	2.13	0.47	0.5064E 01	0.3213E 04	0.16	99.90
16	2.00	0.50	0.3219E 01	0.3216E 04	0.10	100.00



SERIES 2 I

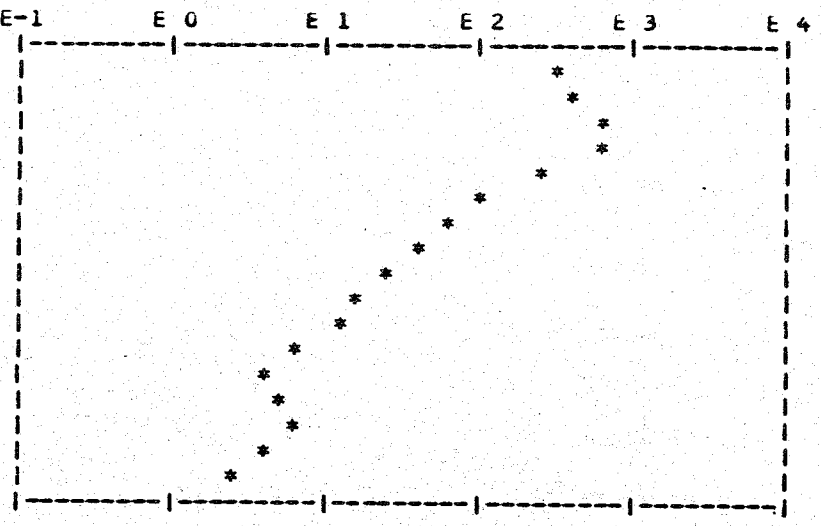
I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.3547E 02	0.3547E 02	5.34	5.34
1	32.00	0.03	0.5336E 02	0.8883E 02	8.03	13.37
2	16.00	0.06	0.1155E 03	0.2043E 03	17.39	30.76
3	10.67	0.09	0.1469E 03	0.3512E 03	22.12	52.88
4	8.00	0.13	0.9421E 02	0.4454E 03	14.18	67.07
5	6.40	0.16	0.5810E 02	0.5035E 03	8.75	75.82
6	5.33	0.19	0.4781E 02	0.5514E 03	7.20	83.02
7	4.57	0.22	0.3345E 02	0.5848E 03	5.04	88.05
8	4.00	0.25	0.1878E 02	0.6036E 03	2.83	90.88
9	3.56	0.28	0.1252E 02	0.6161E 03	1.89	92.76
10	3.20	0.31	0.9430E 01	0.6255E 03	1.42	94.18
11	2.91	0.34	0.5780E 01	0.6313E 03	0.87	95.05
12	2.67	0.38	0.4803E 01	0.6361E 03	0.72	95.78
13	2.46	0.41	0.7226E 01	0.6433E 03	1.09	96.87
14	2.29	0.44	0.8683E 01	0.6520E 03	1.31	98.17
15	2.13	0.47	0.6861E 01	0.6589E 03	1.03	99.21
16	2.00	0.50	0.5274E 01	0.6642E 03	0.79	100.00



AUTO SPECTRA OF ENDOG. VAR. GENERATED BY RESIDUALS

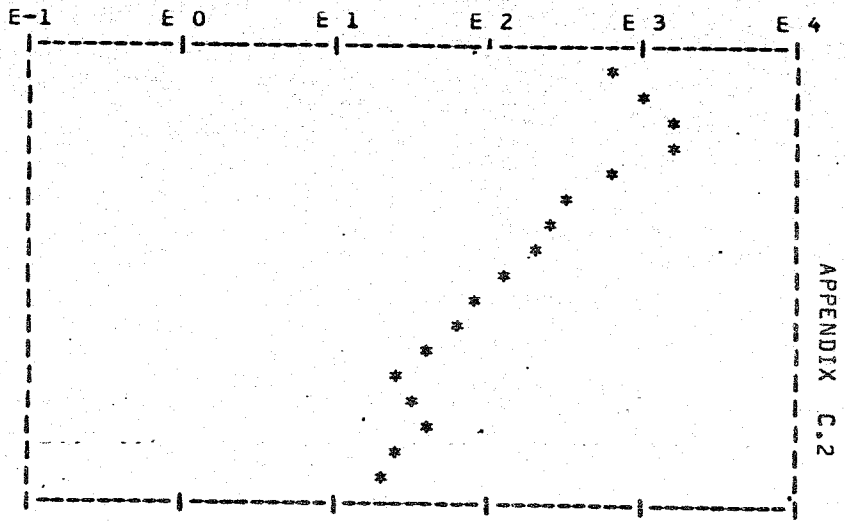
SERIES 3 W1

I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.2893E 03	0.2893E 03	13.08	13.08
1	32.00	0.03	0.3645E 03	0.6538E 03	16.48	29.56
2	16.00	0.06	0.5722E 03	0.1226E 04	25.87	55.44
3	10.67	0.09	0.5112E 03	0.1737E 04	23.12	78.55
4	8.00	0.13	0.2148E 03	0.1952E 04	9.71	88.26
5	6.40	0.16	0.9048E 02	0.2043E 04	4.09	92.35
6	5.33	0.19	0.6031E 02	0.2103E 04	2.73	95.08
7	4.57	0.22	0.3578E 02	0.2139E 04	1.62	96.70
8	4.00	0.25	0.2058E 02	0.2159E 04	0.93	97.63
9	3.56	0.28	0.1584E 02	0.2175E 04	0.72	98.35
10	3.20	0.31	0.1123E 02	0.2186E 04	0.51	98.85
11	2.91	0.34	0.5895E 01	0.2192E 04	0.27	99.12
12	2.67	0.38	0.3866E 01	0.2196E 04	0.17	99.30
13	2.46	0.41	0.4717E 01	0.2201E 04	0.21	99.51
14	2.29	0.44	0.5029E 01	0.2206E 04	0.23	99.74
15	2.13	0.47	0.3487E 01	0.2209E 04	0.16	99.89
16	2.00	0.50	0.2348E 01	0.2212E 04	0.11	100.00



SERIES 4 Y

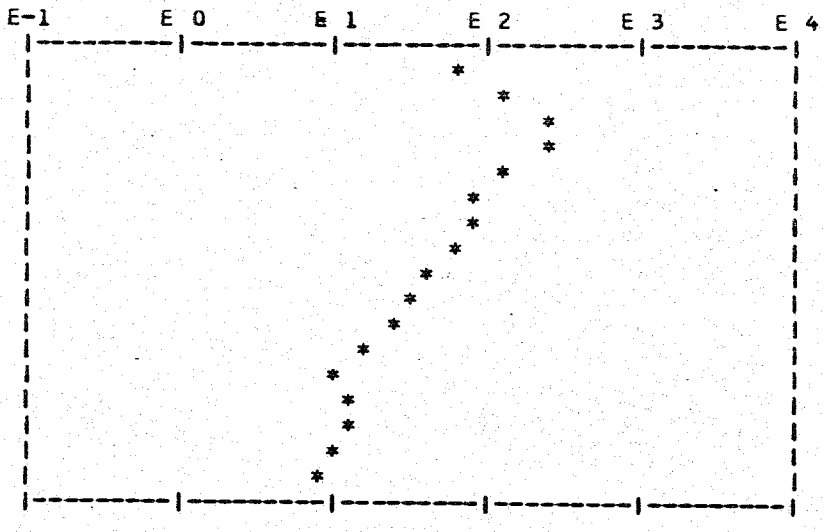
I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.5596E 03	0.5596E 03	9.53	9.53
1	32.00	0.03	0.8129E 03	0.1373E 04	13.85	23.39
2	16.00	0.06	0.1424E 04	0.2796E 04	24.26	47.64
3	10.67	0.09	0.1337E 04	0.4133E 04	22.78	70.42
4	8.00	0.13	0.6180E 03	0.4751E 04	10.53	80.95
5	6.40	0.16	0.3044E 03	0.5056E 04	5.19	86.14
6	5.33	0.19	0.2385E 03	0.5294E 04	4.06	90.20
7	4.57	0.22	0.1692E 03	0.5464E 04	2.88	93.08
8	4.00	0.25	0.1050E 03	0.5569E 04	1.79	94.87
9	3.56	0.28	0.7892E 02	0.5647E 04	1.34	96.22
10	3.20	0.31	0.6143E 02	0.5709E 04	1.05	97.26
11	2.91	0.34	0.3597E 02	0.5745E 04	0.61	97.88
12	2.67	0.38	0.2378E 02	0.5769E 04	0.41	98.28
13	2.46	0.41	0.2978E 02	0.5798E 04	0.51	98.79
14	2.29	0.44	0.3232E 02	0.5831E 04	0.55	99.34
15	2.13	0.47	0.2277E 02	0.5853E 04	0.39	99.73
16	2.00	0.50	0.1597E 02	0.5869E 04	0.27	100.00



AUTO SPECTRA OF ENDOG. VAR. GENERATED BY RESIDUALS

SERIES 5 P

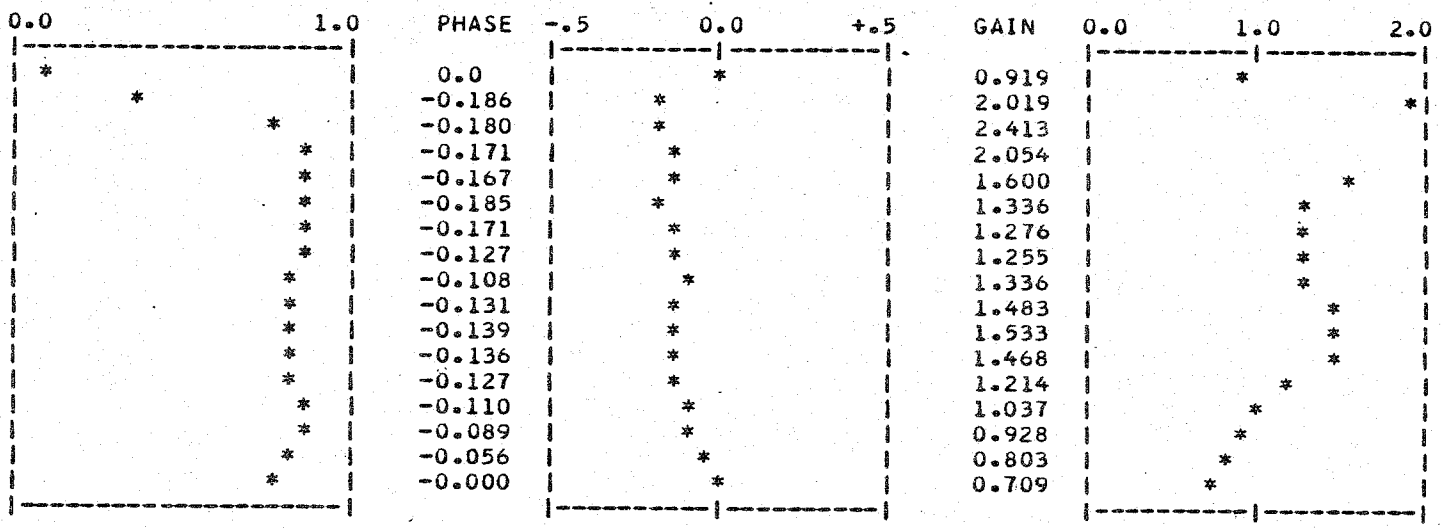
I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.5727E 02	0.5727E 02	5.41	5.41
1	32.00	0.03	0.1052E 03	0.1625E 03	9.94	15.34
2	16.00	0.06	0.2107E 03	0.3732E 03	19.89	35.24
3	10.67	0.09	0.2164E 03	0.5895E 03	20.43	55.67
4	8.00	0.13	0.1171E 03	0.7066E 03	11.06	66.72
5	6.40	0.16	0.7286E 02	0.7795E 03	6.88	73.60
6	5.33	0.19	0.7070E 02	0.8502E 03	6.68	80.28
7	4.57	0.22	0.5866E 02	0.9089E 03	5.54	85.82
8	4.00	0.25	0.3785E 02	0.9467E 03	3.57	89.39
9	3.56	0.28	0.2709E 02	0.9738E 03	2.56	91.95
10	3.20	0.31	0.2182E 02	0.9956E 03	2.06	94.01
11	2.91	0.34	0.1377E 02	0.1009E 04	1.30	95.31
12	2.67	0.38	0.9348E 01	0.1019E 04	0.88	96.19
13	2.46	0.41	0.1140E 02	0.1030E 04	1.08	97.27
14	2.29	0.44	0.1238E 02	0.1043E 04	1.17	98.44
15	2.13	0.47	0.9323E 01	0.1052E 04	0.88	99.32
16	2.00	0.50	0.7220E 01	0.1059E 04	0.68	100.00



CROSS SPECTRA OF ENDOG. VAR. GENERATED BY RESIDUALS

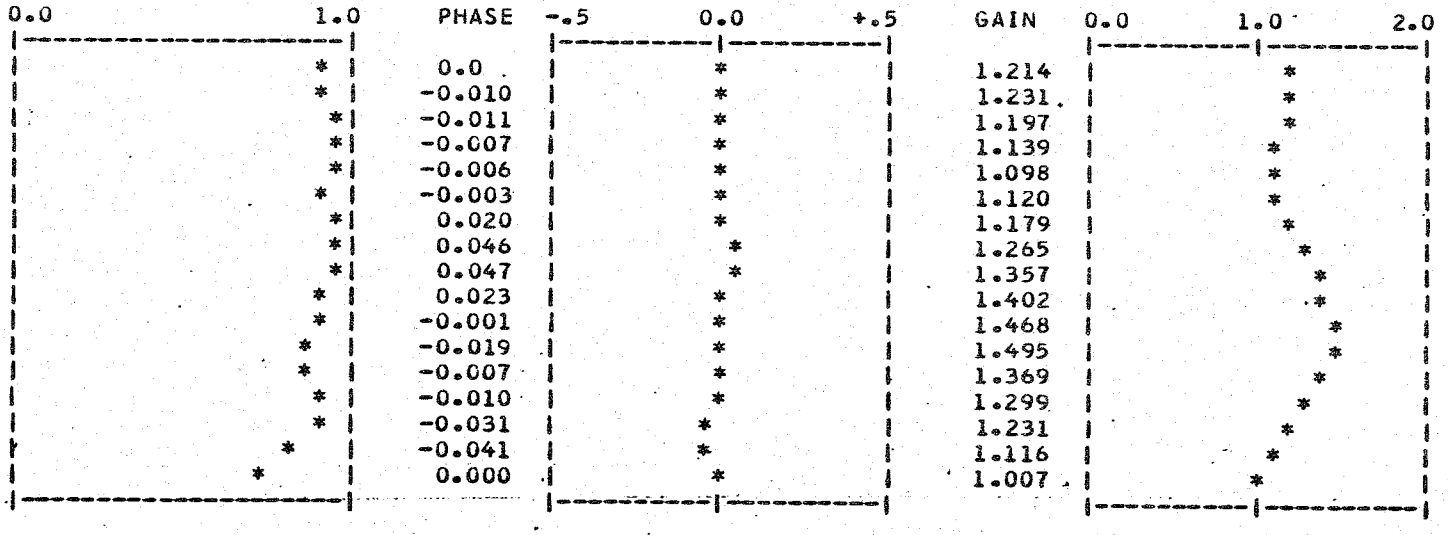
SERIES 1 C AND SERIES 2 I

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.065	0.0	0.919
1	32.00	0.03	0.375	-0.186	2.019
2	16.00	0.06	0.803	-0.180	2.413
3	10.67	0.09	0.923	-0.171	2.054
4	8.00	0.13	0.918	-0.167	1.600
5	6.40	0.16	0.890	-0.185	1.336
6	5.33	0.19	0.906	-0.171	1.276
7	4.57	0.22	0.901	-0.127	1.255
8	4.00	0.25	0.863	-0.108	1.336
9	3.56	0.28	0.851	-0.131	1.483
10	3.20	0.31	0.860	-0.139	1.533
11	2.91	0.34	0.844	-0.136	1.468
12	2.67	0.38	0.860	-0.127	1.214
13	2.46	0.41	0.921	-0.110	1.037
14	2.29	0.44	0.918	-0.089	0.928
15	2.13	0.47	0.873	-0.056	0.803
16	2.00	0.50	0.823	-0.000	0.709



SERIES 1 C AND SERIES 3 W1

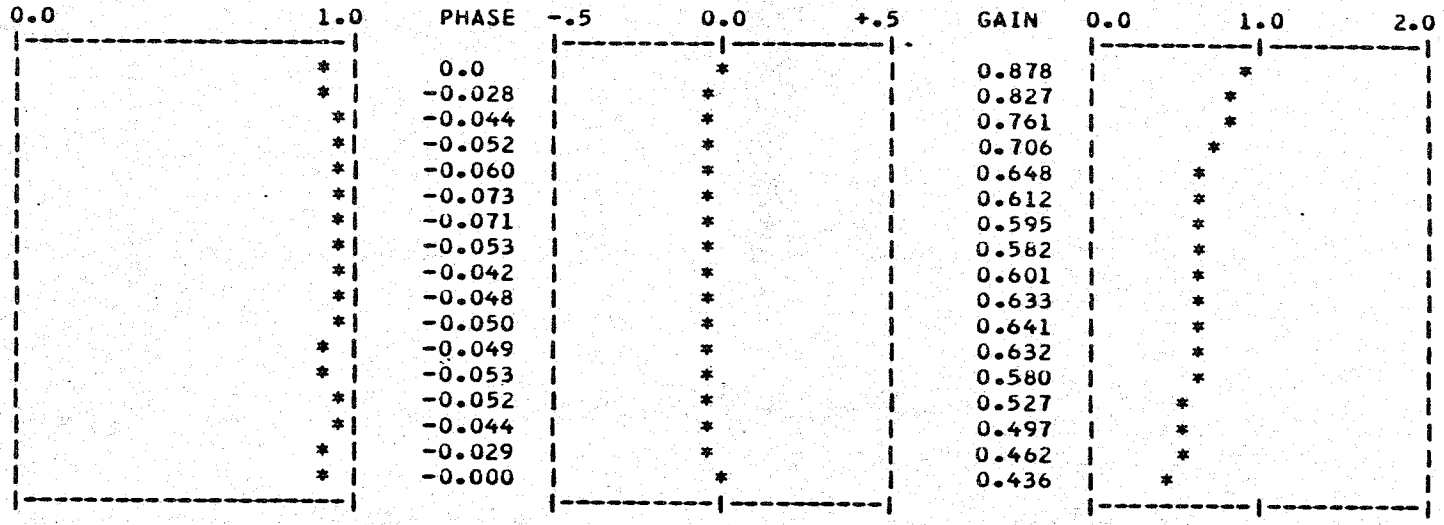
I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.929	0.0	1.214
1	32.00	0.03	0.952	-0.010	1.231
2	16.00	0.06	0.980	-0.011	1.197
3	10.67	0.09	0.988	-0.007	1.139
4	8.00	0.13	0.985	-0.006	1.098
5	6.40	0.16	0.974	-0.003	1.120
6	5.33	0.19	0.976	0.020	1.179
7	4.57	0.22	0.980	0.046	1.265
8	4.00	0.25	0.976	0.047	1.357
9	3.56	0.28	0.963	0.023	1.402
10	3.20	0.31	0.939	-0.001	1.468
11	2.91	0.34	0.892	-0.019	1.495
12	2.67	0.38	0.879	-0.007	1.369
13	2.46	0.41	0.943	-0.010	1.299
14	2.29	0.44	0.935	-0.031	1.231
15	2.13	0.47	0.857	-0.041	1.116
16	2.00	0.50	0.739	0.000	1.007



CROSS SPECTRA OF ENDOG. VAR. GENERATED BY RESIDUALS

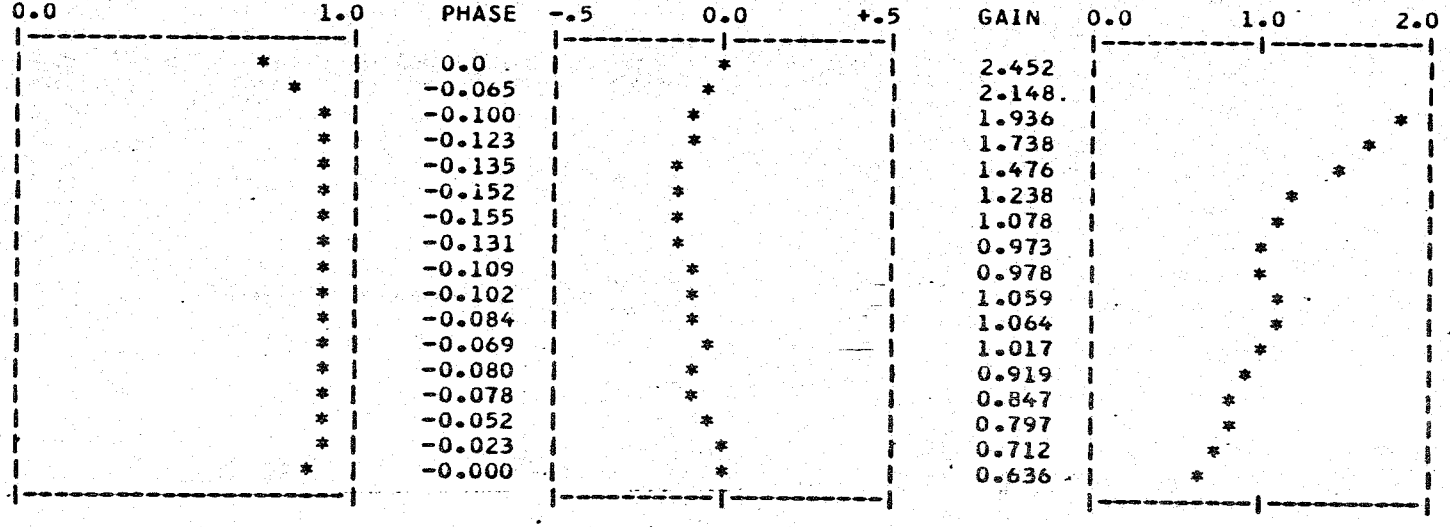
SERIES 1 C AND SERIES 4 Y

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.941	0.0	0.878
1	32.00	0.03	0.959	-0.028	0.827
2	16.00	0.06	0.984	-0.044	0.761
3	10.67	0.09	0.992	-0.052	0.706
4	8.00	0.13	0.987	-0.060	0.648
5	6.40	0.16	0.979	-0.073	0.612
6	5.33	0.19	0.981	-0.071	0.595
7	4.57	0.22	0.981	-0.053	0.582
8	4.00	0.25	0.975	-0.042	0.601
9	3.56	0.28	0.976	-0.048	0.633
10	3.20	0.31	0.978	-0.050	0.641
11	2.91	0.34	0.975	-0.049	0.632
12	2.67	0.38	0.972	-0.053	0.580
13	2.46	0.41	0.981	-0.052	0.527
14	2.29	0.44	0.978	-0.044	0.497
15	2.13	0.47	0.962	-0.029	0.462
16	2.00	0.50	0.941	-0.000	0.436



SERIES 1 C AND SERIES 5 P

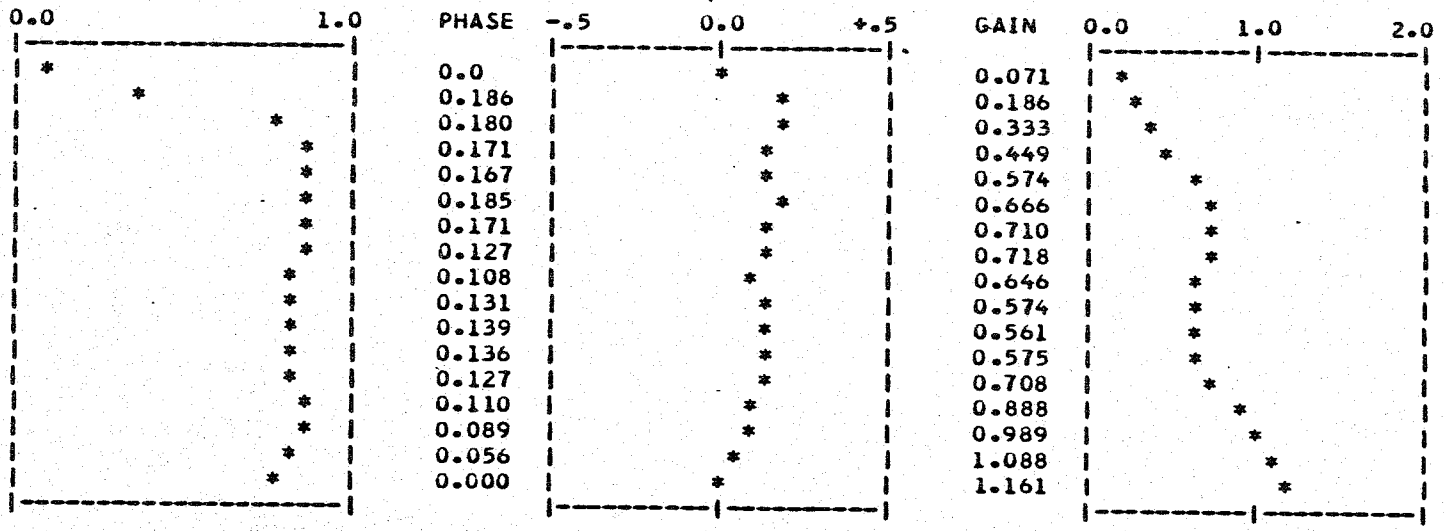
I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.750	0.0	2.452
1	32.00	0.03	0.837	-0.065	2.148
2	16.00	0.06	0.943	-0.100	1.936
3	10.67	0.09	0.973	-0.123	1.738
4	8.00	0.13	0.971	-0.135	1.476
5	6.40	0.16	0.958	-0.152	1.238
6	5.33	0.19	0.956	-0.155	1.078
7	4.57	0.22	0.950	-0.131	0.973
8	4.00	0.25	0.932	-0.109	0.978
9	3.56	0.28	0.938	-0.102	1.059
10	3.20	0.31	0.958	-0.084	1.064
11	2.91	0.34	0.965	-0.069	1.017
12	2.67	0.38	0.959	-0.080	0.919
13	2.46	0.41	0.969	-0.078	0.847
14	2.29	0.44	0.964	-0.052	0.797
15	2.13	0.47	0.935	-0.023	0.712
16	2.00	0.50	0.908	-0.000	0.636



CROSS SPECTRA OF ENDOG. VAR. GENERATED BY RESIDUALS

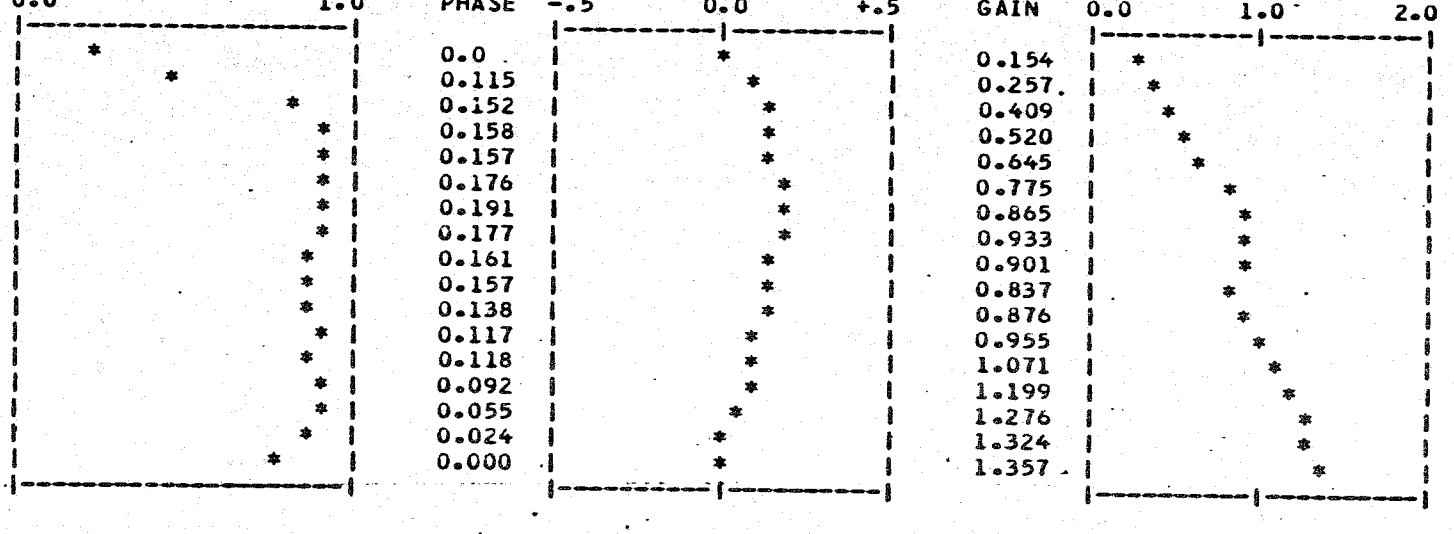
SERIES 2 I AND SERIES 1 C

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.065	0.0	0.071
1	32.00	0.03	0.375	0.186	0.186
2	16.00	0.06	0.803	0.180	0.333
3	10.67	0.09	0.923	0.171	0.449
4	8.00	0.13	0.918	0.167	0.574
5	6.40	0.16	0.890	0.185	0.666
6	5.33	0.19	0.906	0.171	0.710
7	4.57	0.22	0.901	0.127	0.718
8	4.00	0.25	0.863	0.108	0.646
9	3.56	0.28	0.851	0.131	0.574
10	3.20	0.31	0.860	0.139	0.561
11	2.91	0.34	0.844	0.136	0.575
12	2.67	0.38	0.860	0.127	0.708
13	2.46	0.41	0.921	0.110	0.888
14	2.29	0.44	0.918	0.089	0.989
15	2.13	0.47	0.873	0.056	1.088
16	2.00	0.50	0.823	0.000	1.161



SERIES 2 I AND SERIES 3 W1

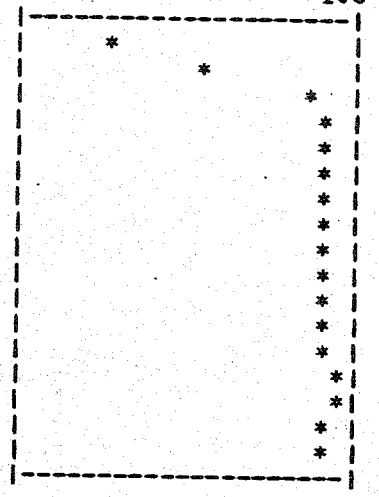
I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.195	0.0	0.154
1	32.00	0.03	0.452	0.115	0.257
2	16.00	0.06	0.828	0.152	0.409
3	10.67	0.09	0.941	0.158	0.520
4	8.00	0.13	0.950	0.157	0.645
5	6.40	0.16	0.936	0.176	0.775
6	5.33	0.19	0.943	0.191	0.865
7	4.57	0.22	0.932	0.177	0.933
8	4.00	0.25	0.889	0.161	0.901
9	3.56	0.28	0.886	0.157	0.837
10	3.20	0.31	0.915	0.138	0.876
11	2.91	0.34	0.930	0.117	0.955
12	2.67	0.38	0.924	0.118	1.071
13	2.46	0.41	0.939	0.092	1.199
14	2.29	0.44	0.943	0.055	1.276
15	2.13	0.47	0.892	0.024	1.324
16	2.00	0.50	0.819	0.000	1.357



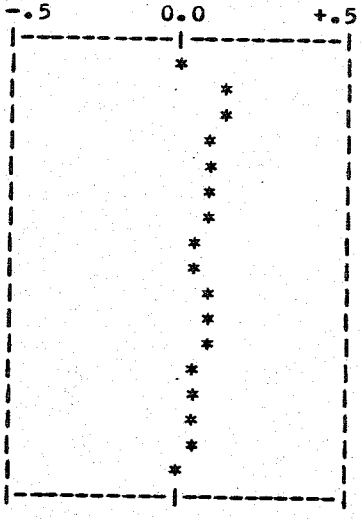
CROSS SPECTRA OF ENDOG. VAR. GENERATED BY RESIDUALS

SERIES 2 I AND SERIES 4 Y

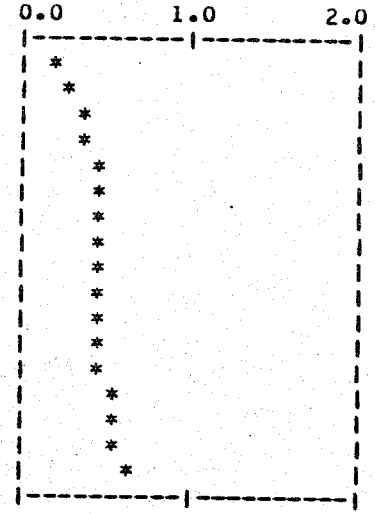
I	T(I)	L(I)	COHERENCE
0	999.99	0.0	0.233
1	32.00	0.03	0.554
2	16.00	0.06	0.884
3	10.67	0.09	0.961
4	8.00	0.13	0.965
5	6.40	0.16	0.958
6	5.33	0.19	0.966
7	4.57	0.22	0.966
8	4.00	0.25	0.949
9	3.56	0.28	0.939
10	3.20	0.31	0.941
11	2.91	0.34	0.936
12	2.67	0.38	0.951
13	2.46	0.41	0.978
14	2.29	0.44	0.979
15	2.13	0.47	0.972
16	2.00	0.50	0.964



PHASE
0.0
0.125
0.128
0.115
0.103
0.106
0.096
0.071
0.062
0.079
0.084
0.081
0.070
0.056
0.043
0.025
0.000

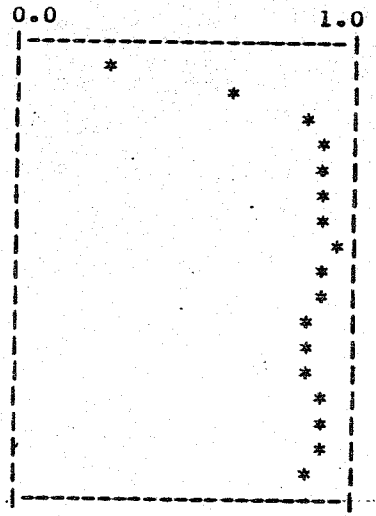


GAIN
0.122
0.191
0.268
0.325
0.384
0.428
0.440
0.437
0.412
0.386
0.380
0.388
0.438
0.487
0.513
0.541
0.564

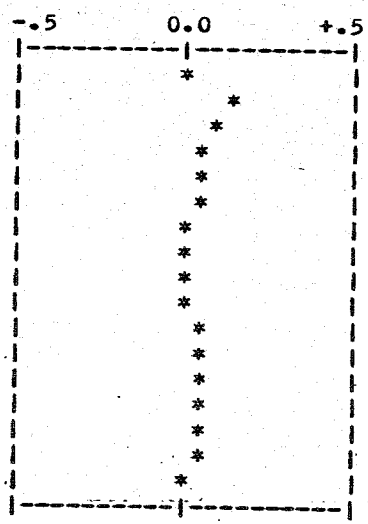


SERIES 2 I AND SERIES 5 P

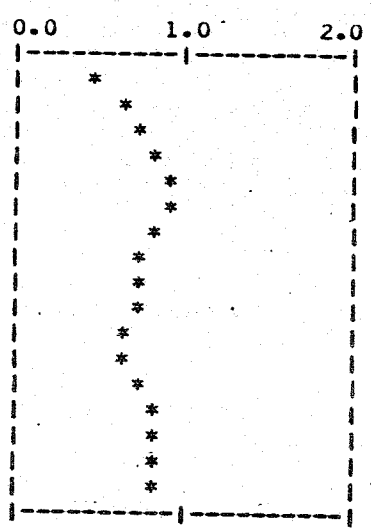
I	T(I)	L(I)	COHERENCE
0	999.99	0.0	0.269
1	32.00	0.03	0.673
2	16.00	0.06	0.913
3	10.67	0.09	0.961
4	8.00	0.13	0.963
5	6.40	0.16	0.955
6	5.33	0.19	0.966
7	4.57	0.22	0.976
8	4.00	0.25	0.969
9	3.56	0.28	0.945
10	3.20	0.31	0.918
11	2.91	0.34	0.882
12	2.67	0.38	0.901
13	2.46	0.41	0.963
14	2.29	0.44	0.962
15	2.13	0.47	0.927
16	2.00	0.50	0.892



PHASE
0.0
0.141
0.090
0.050
0.030
0.029
0.010
-0.009
-0.008
0.020
0.046
0.057
0.039
0.033
0.035
0.026
0.000



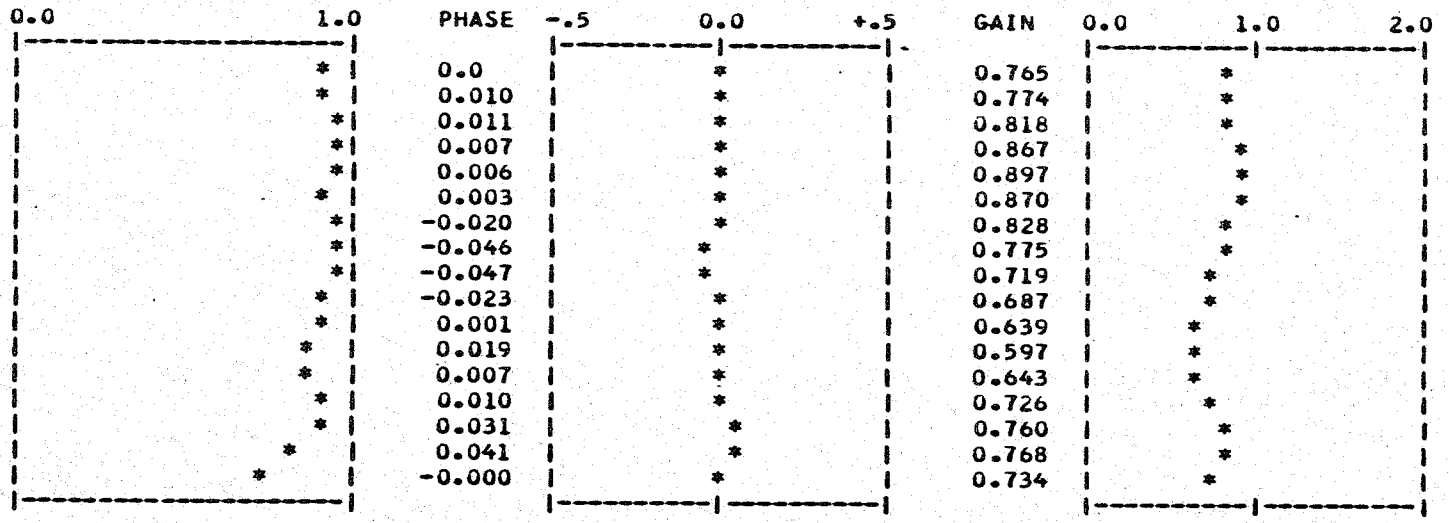
GAIN
0.408
0.584
0.707
0.808
0.880
0.873
0.808
0.746
0.693
0.661
0.630
0.608
0.680
0.781
0.821
0.826
0.807



CROSS SPECTRA OF ENDOG. VAR. GENERATED BY RESIDUALS

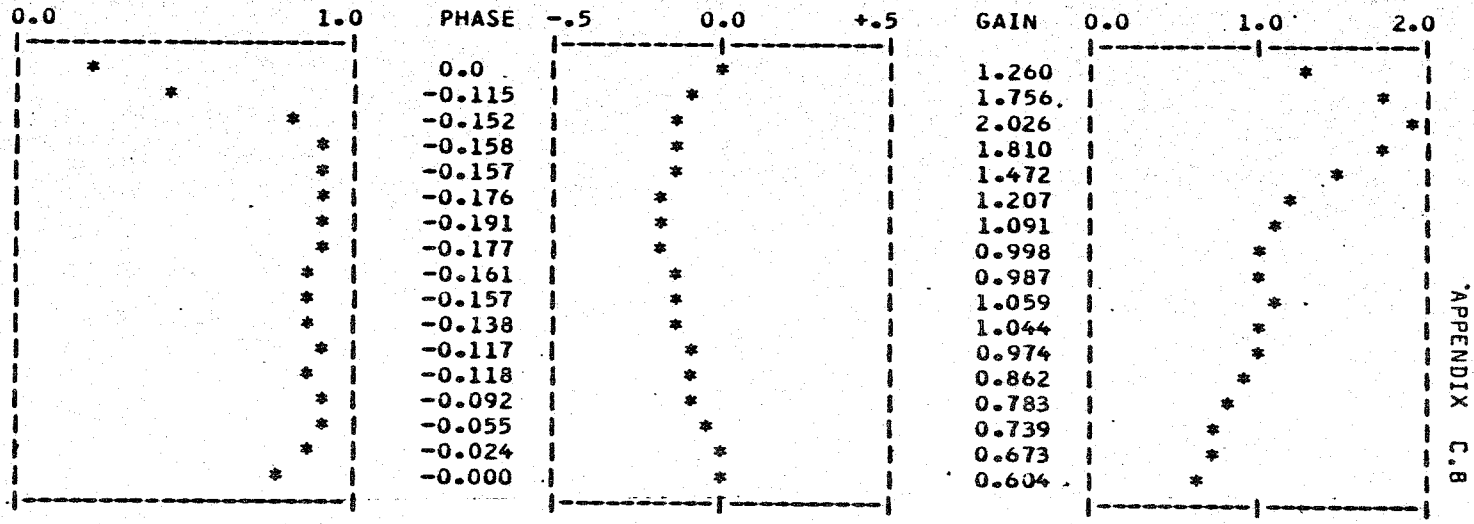
SERIES 3 W1 AND SERIES 1 C

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.929	0.0	0.765
1	32.00	0.03	0.952	0.010	0.774
2	16.00	0.06	0.980	0.011	0.818
3	10.67	0.09	0.988	0.007	0.867
4	8.00	0.13	0.985	0.006	0.897
5	6.40	0.16	0.974	0.003	0.870
6	5.33	0.19	0.976	-0.020	0.828
7	4.57	0.22	0.980	-0.046	0.775
8	4.00	0.25	0.976	-0.047	0.719
9	3.56	0.28	0.963	-0.023	0.687
10	3.20	0.31	0.939	0.001	0.639
11	2.91	0.34	0.892	0.019	0.597
12	2.67	0.38	0.879	0.007	0.643
13	2.46	0.41	0.943	0.010	0.726
14	2.29	0.44	0.935	0.031	0.760
15	2.13	0.47	0.857	0.041	0.768
16	2.00	0.50	0.739	-0.000	0.734



SERIES 3 W1 AND SERIES 2 I

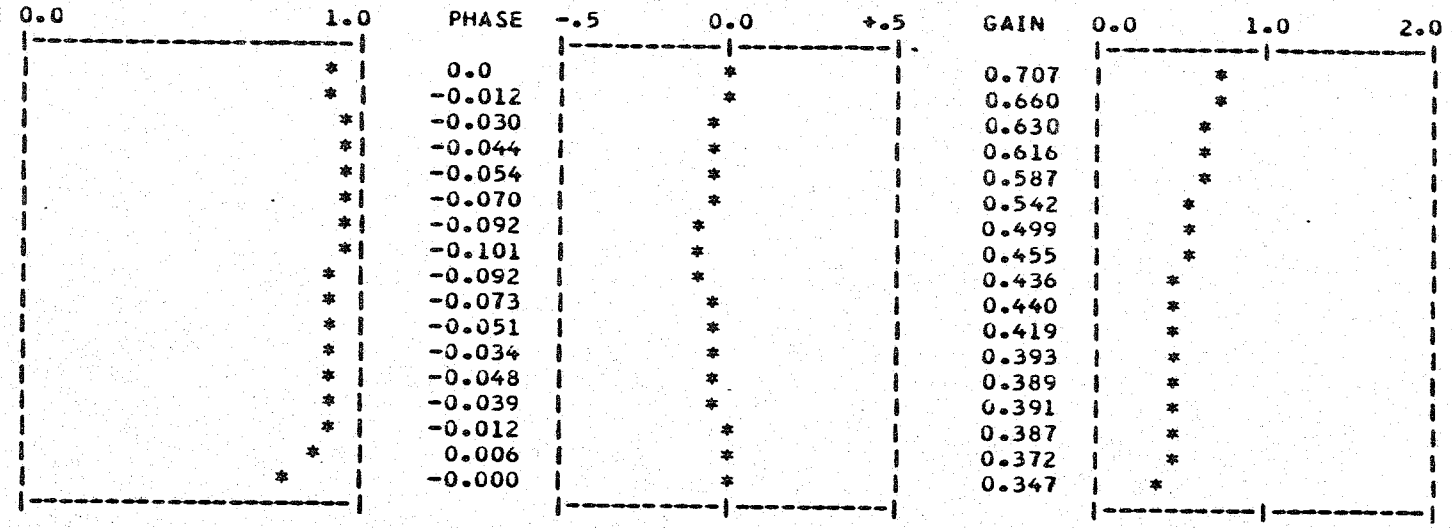
I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.195	0.0	1.260
1	32.00	0.03	0.452	-0.115	1.756
2	16.00	0.06	0.828	-0.152	2.026
3	10.67	0.09	0.941	-0.158	1.810
4	8.00	0.13	0.950	-0.157	1.472
5	6.40	0.16	0.936	-0.176	1.207
6	5.33	0.19	0.943	-0.191	1.091
7	4.57	0.22	0.932	-0.177	0.998
8	4.00	0.25	0.889	-0.161	0.987
9	3.56	0.28	0.886	-0.157	1.059
10	3.20	0.31	0.915	-0.138	1.044
11	2.91	0.34	0.930	-0.117	0.974
12	2.67	0.38	0.924	-0.118	0.862
13	2.46	0.41	0.939	-0.092	0.783
14	2.29	0.44	0.943	-0.055	0.739
15	2.13	0.47	0.892	-0.024	0.673
16	2.00	0.50	0.819	-0.000	0.604



CROSS SPECTRA OF ENDOG. VAR. GENERATED BY RESIDUALS

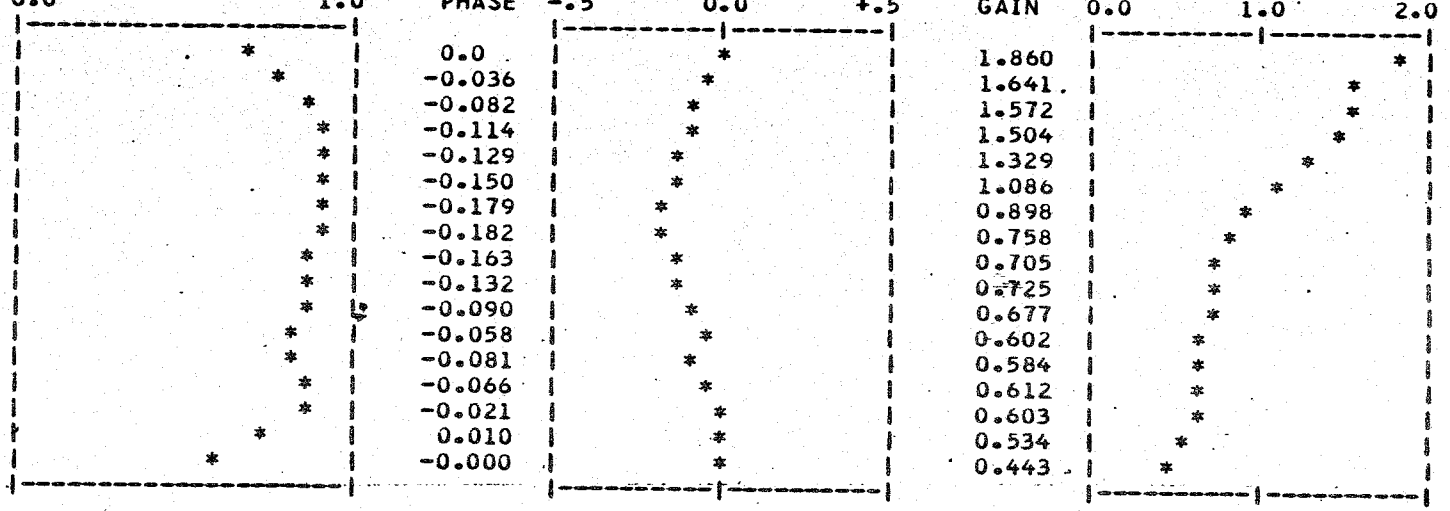
SERIES 3 W1 AND SERIES 4 Y

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.968	0.0	0.707
1	32.00	0.03	0.971	-0.012	0.660
2	16.00	0.06	0.987	-0.030	0.630
3	10.67	0.09	0.993	-0.044	0.616
4	8.00	0.13	0.993	-0.054	0.587
5	6.40	0.16	0.988	-0.070	0.542
6	5.33	0.19	0.984	-0.092	0.499
7	4.57	0.22	0.980	-0.101	0.455
8	4.00	0.25	0.969	-0.092	0.436
9	3.56	0.28	0.965	-0.073	0.440
10	3.20	0.31	0.961	-0.051	0.419
11	2.91	0.34	0.941	-0.034	0.393
12	2.67	0.38	0.931	-0.048	0.389
13	2.46	0.41	0.963	-0.039	0.391
14	2.29	0.44	0.960	-0.012	0.387
15	2.13	0.47	0.903	0.006	0.372
16	2.00	0.50	0.821	-0.000	0.347



SERIES 3 W1 AND SERIES 5 P

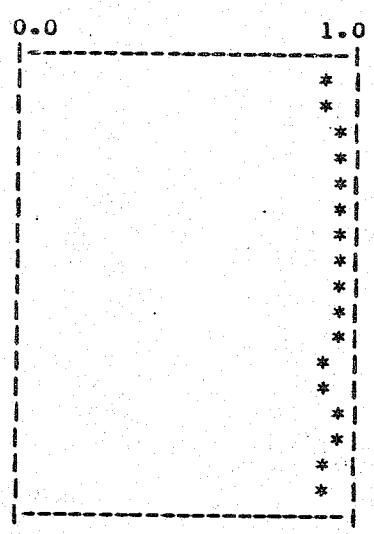
I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.685	0.0	1.860
1	32.00	0.03	0.778	-0.036	1.641
2	16.00	0.06	0.910	-0.082	1.572
3	10.67	0.09	0.957	-0.114	1.504
4	8.00	0.13	0.963	-0.129	1.329
5	6.40	0.16	0.949	-0.150	1.086
6	5.33	0.19	0.946	-0.179	0.898
7	4.57	0.22	0.942	-0.182	0.758
8	4.00	0.25	0.914	-0.163	0.705
9	3.56	0.28	0.899	-0.132	0.725
10	3.20	0.31	0.890	-0.090	0.677
11	2.91	0.34	0.847	-0.058	0.602
12	2.67	0.38	0.825	-0.081	0.584
13	2.46	0.41	0.904	-0.066	0.612
14	2.29	0.44	0.896	-0.021	0.603
15	2.13	0.47	0.763	0.010	0.534
16	2.00	0.50	0.604	-0.000	0.443



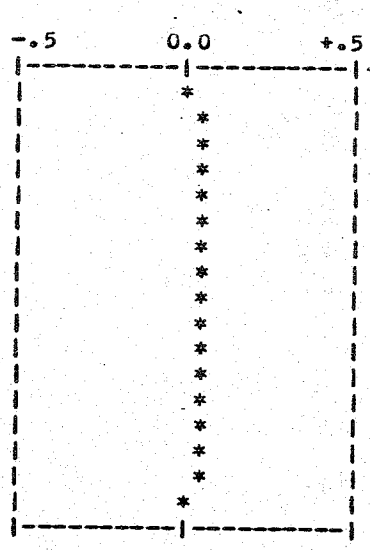
CROSS SPECTRA OF ENDOG. VAR. GENERATED BY RESIDUALS

SERIES 4 Y AND SERIES 1 C

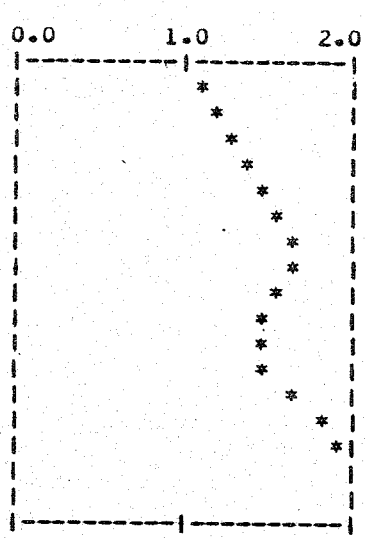
I	T(I)	L(I)	COHERENCE
0	999.99	0.0	0.941
1	32.00	0.03	0.959
2	16.00	0.06	0.984
3	10.67	0.09	0.992
4	8.00	0.13	0.987
5	6.40	0.16	0.979
6	5.33	0.19	0.981
7	4.57	0.22	0.981
8	4.00	0.25	0.975
9	3.56	0.28	0.976
10	3.20	0.31	0.978
11	2.91	0.34	0.975
12	2.67	0.38	0.972
13	2.46	0.41	0.981
14	2.29	0.44	0.978
15	2.13	0.47	0.962
16	2.00	0.50	0.941



PHASE
0.0
0.028
0.044
0.052
0.060
0.073
0.071
0.053
0.042
0.048
0.050
0.049
0.053
0.052
0.044
0.029
0.000

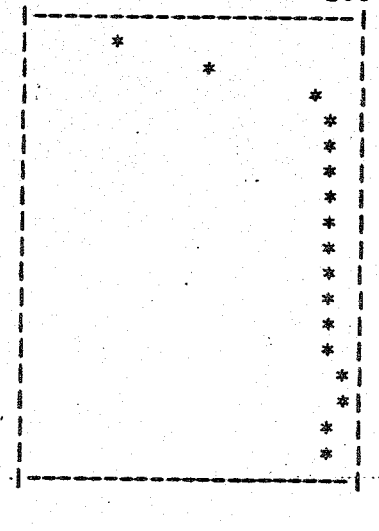


GAIN
1.071
1.159
1.293
1.405
1.524
1.599
1.650
1.685
1.623
1.543
1.527
1.542
1.675
1.860
1.970
2.079
2.161

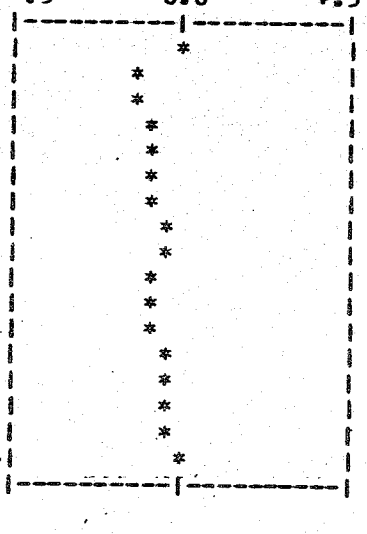


SERIES 4 Y AND SERIES 2 I

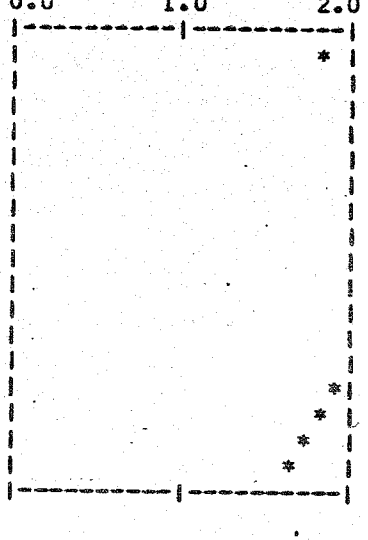
I	T(I)	L(I)	COHERENCE
0	999.99	0.0	0.233
1	32.00	0.03	0.554
2	16.00	0.06	0.884
3	10.67	0.09	0.961
4	8.00	0.13	0.965
5	6.40	0.16	0.958
6	5.33	0.19	0.966
7	4.57	0.22	0.966
8	4.00	0.25	0.949
9	3.56	0.28	0.939
10	3.20	0.31	0.941
11	2.91	0.34	0.936
12	2.67	0.38	0.951
13	2.46	0.41	0.978
14	2.29	0.44	0.979
15	2.13	0.47	0.972
16	2.00	0.50	0.964



PHASE
0.0
-0.125
-0.128
-0.115
-0.103
-0.106
-0.096
-0.071
-0.062
-0.079
-0.084
-0.081
-0.070
-0.056
-0.043
-0.025
-0.000



GAIN
1.919
2.906
3.301
2.958
2.516
2.240
2.195
2.210
2.304
2.433
2.476
2.413
2.171
2.007
1.909
1.796
1.709



CROSS SPECTRA OF ENDOG. VAR. GENERATED BY RESIDUALS

SERIES 4 Y AND SERIES 3 W1

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.968	0.0	1.368
1	32.00	0.03	0.971	0.012	1.472
2	16.00	0.06	0.987	0.030	1.567
3	10.67	0.09	0.993	0.044	1.612
4	8.00	0.13	0.993	0.054	1.690
5	6.40	0.16	0.988	0.070	1.823
6	5.33	0.19	0.984	0.092	1.973
7	4.57	0.22	0.980	0.101	2.153
8	4.00	0.25	0.969	0.092	2.223
9	3.56	0.28	0.965	0.073	2.193
10	3.20	0.31	0.961	0.051	2.292
11	2.91	0.34	0.941	0.034	2.397
12	2.67	0.38	0.931	0.048	2.394
13	2.46	0.41	0.963	0.039	2.466
14	2.29	0.44	0.960	0.012	2.484
15	2.13	0.47	0.903	-0.006	2.428
16	2.00	0.50	0.821	0.000	2.363

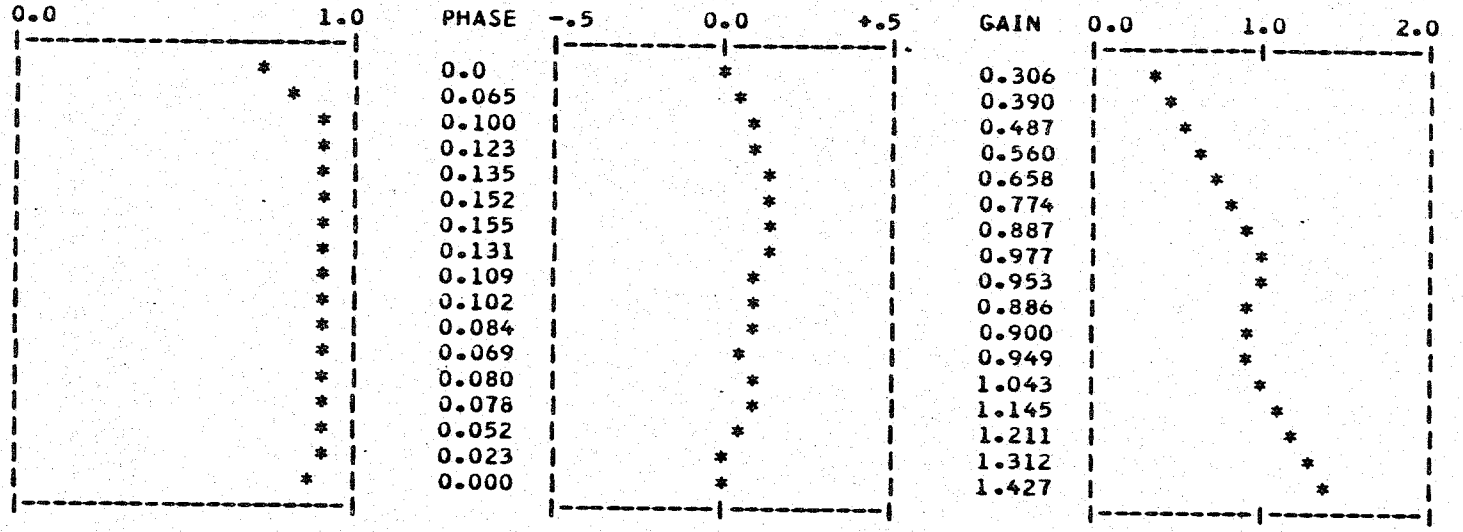
SERIES 4 Y AND SERIES 5 P

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.837	0.0	2.860
1	32.00	0.03	0.900	-0.022	2.637
2	16.00	0.06	0.964	-0.050	2.552
3	10.67	0.09	0.984	-0.068	2.466
4	8.00	0.13	0.987	-0.074	2.282
5	6.40	0.16	0.985	-0.078	2.029
6	5.33	0.19	0.986	-0.085	1.824
7	4.57	0.22	0.988	-0.078	1.688
8	4.00	0.25	0.983	-0.067	1.651
9	3.56	0.28	0.980	-0.055	1.689
10	3.20	0.31	0.980	-0.036	1.661
11	2.91	0.34	0.975	-0.022	1.596
12	2.67	0.38	0.972	-0.030	1.572
13	2.46	0.41	0.985	-0.025	1.604
14	2.29	0.44	0.984	-0.008	1.602
15	2.13	0.47	0.964	0.003	1.534
16	2.00	0.50	0.942	-0.000	1.443

CROSS SPECTRA OF ENDOG. VAR. GENERATED BY RESIDUALS

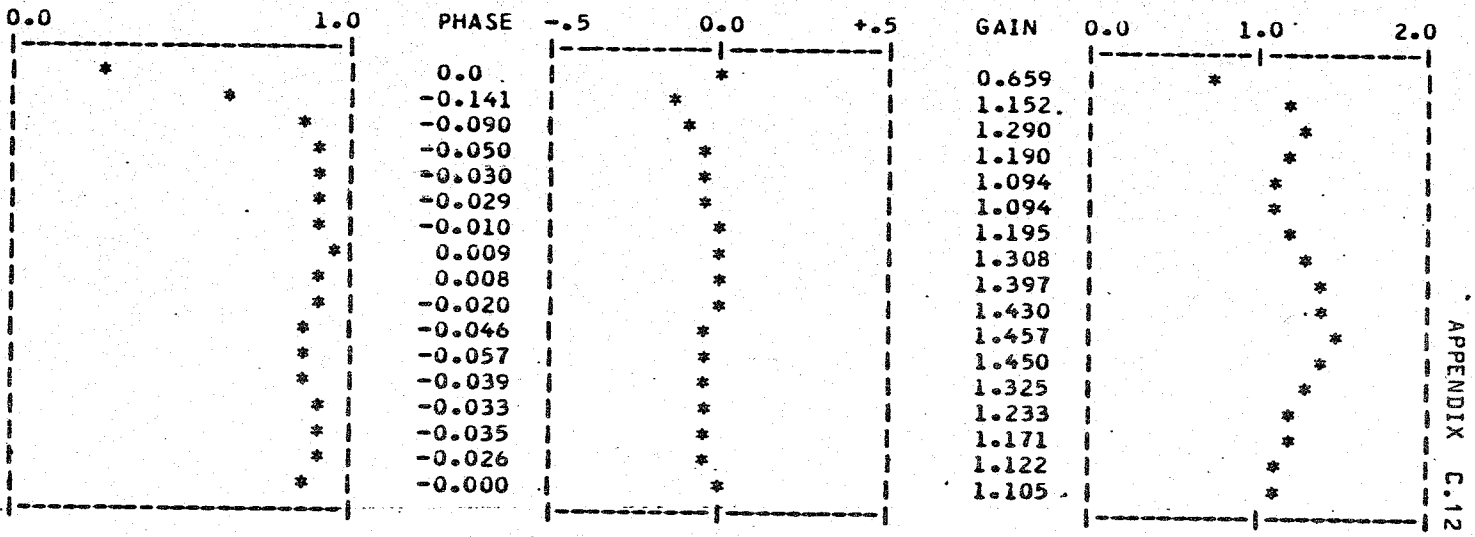
SERIES 5 P AND SERIES 1 C

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.750	0.0	0.306
1	32.00	0.03	0.837	0.065	0.390
2	16.00	0.06	0.943	0.100	0.487
3	10.67	0.09	0.973	0.123	0.560
4	8.00	0.13	0.971	0.135	0.658
5	6.40	0.16	0.958	0.152	0.774
6	5.33	0.19	0.956	0.155	0.887
7	4.57	0.22	0.950	0.131	0.977
8	4.00	0.25	0.932	0.109	0.953
9	3.56	0.28	0.938	0.102	0.886
10	3.20	0.31	0.958	0.084	0.900
11	2.91	0.34	0.965	0.069	0.949
12	2.67	0.38	0.959	0.080	1.043
13	2.46	0.41	0.969	0.078	1.145
14	2.29	0.44	0.964	0.052	1.211
15	2.13	0.47	0.935	0.023	1.312
16	2.00	0.50	0.908	0.000	1.427



SERIES 5 P AND SERIES 2 I

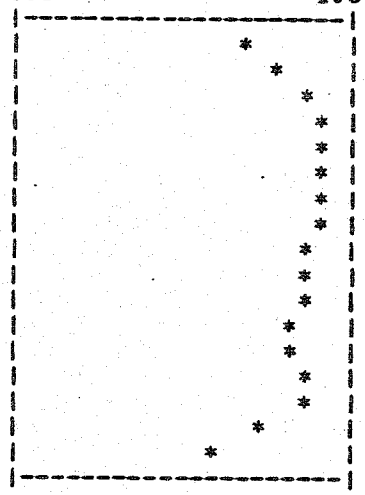
I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.269	0.0	0.659
1	32.00	0.03	0.673	-0.141	1.152
2	16.00	0.06	0.913	-0.090	1.290
3	10.67	0.09	0.961	-0.050	1.190
4	8.00	0.13	0.963	-0.030	1.094
5	6.40	0.16	0.955	-0.029	1.094
6	5.33	0.19	0.966	-0.010	1.195
7	4.57	0.22	0.976	0.009	1.308
8	4.00	0.25	0.969	0.008	1.397
9	3.56	0.28	0.945	-0.020	1.430
10	3.20	0.31	0.918	-0.046	1.457
11	2.91	0.34	0.882	-0.057	1.450
12	2.67	0.38	0.901	-0.039	1.325
13	2.46	0.41	0.963	-0.033	1.233
14	2.29	0.44	0.962	-0.035	1.171
15	2.13	0.47	0.927	-0.026	1.122
16	2.00	0.50	0.892	-0.000	1.105



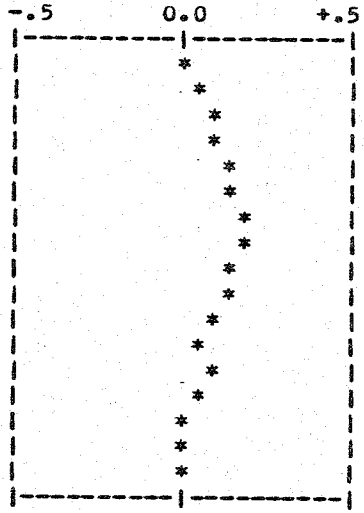
CROSS SPECTRA OF ENDOG. VAR. GENERATED BY RESIDUALS

SERIES 5 P AND SERIES 3 W1

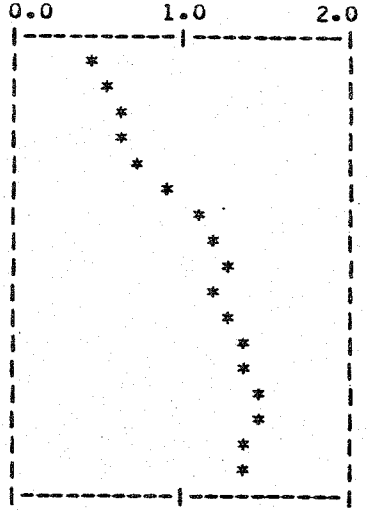
I	T(I)	L(I)	COHERENCE
0	999.99	0.0	0.685
1	32.00	0.03	0.778
2	16.00	0.06	0.910
3	10.67	0.09	0.957
4	8.00	0.13	0.963
5	6.40	0.16	0.949
6	5.33	0.19	0.946
7	4.57	0.22	0.942
8	4.00	0.25	0.914
9	3.56	0.28	0.899
10	3.20	0.31	0.890
11	2.91	0.34	0.847
12	2.67	0.38	0.825
13	2.46	0.41	0.904
14	2.29	0.44	0.896
15	2.13	0.47	0.763
16	2.00	0.50	0.604



PHASE
0.0
0.036
0.082
0.114
0.129
0.150
0.179
0.182
0.163
0.132
0.090
0.058
0.081
0.066
0.021
-0.010
0.000

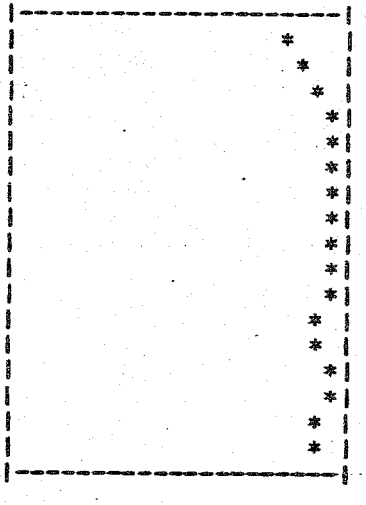


GAIN
0.368
0.474
0.579
0.636
0.724
0.874
1.053
1.243
1.297
1.240
1.315
1.406
1.413
1.479
1.485
1.428
1.363

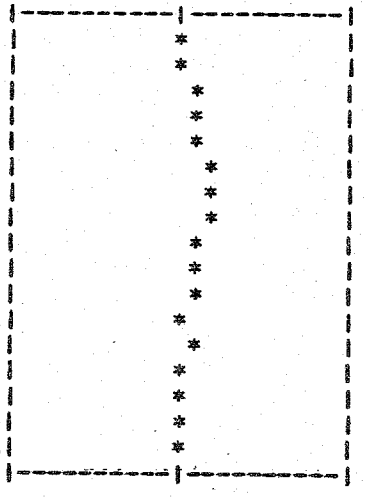


SERIES 5 P AND SERIES 4 Y

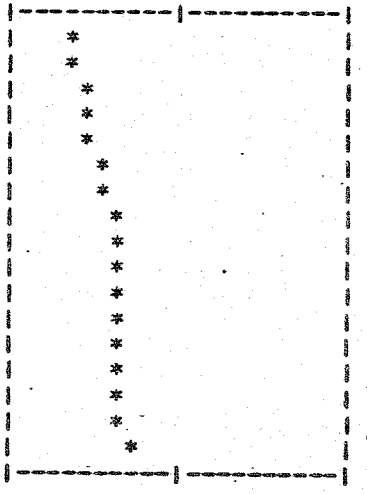
I	T(I)	L(I)	COHERENCE
0	999.99	0.0	0.837
1	32.00	0.03	0.900
2	16.00	0.06	0.964
3	10.67	0.09	0.984
4	8.00	0.13	0.987
5	6.40	0.16	0.985
6	5.33	0.19	0.986
7	4.57	0.22	0.988
8	4.00	0.25	0.983
9	3.56	0.28	0.980
10	3.20	0.31	0.980
11	2.91	0.34	0.975
12	2.67	0.38	0.972
13	2.46	0.41	0.985
14	2.29	0.44	0.984
15	2.13	0.47	0.964
16	2.00	0.50	0.942



PHASE
0.0
0.022
0.050
0.068
0.074
0.078
0.085
0.078
0.067
0.055
0.036
0.022
0.030
0.025
0.008
-0.003
0.000



GAIN
0.293
0.341
0.378
0.399
0.432
0.486
0.541
0.585
0.595
0.580
0.590
0.611
0.618
0.614
0.614
0.628
0.653



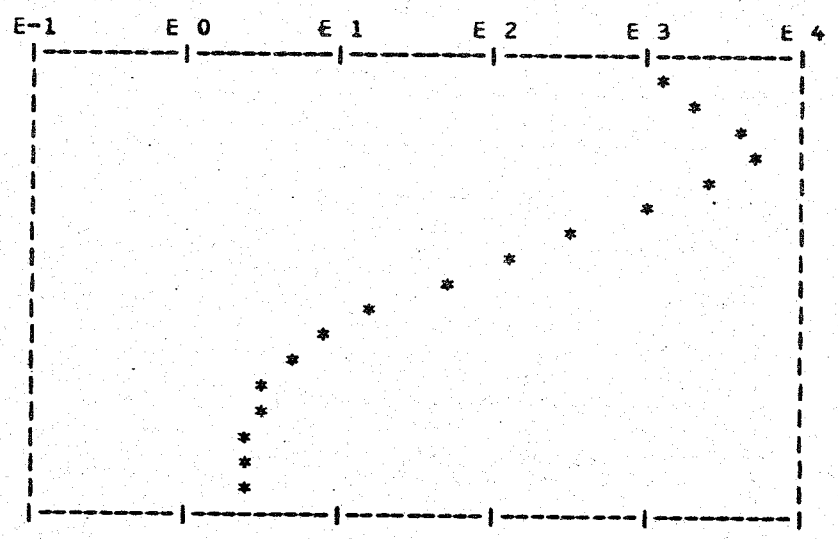
APPENDIX D:

Spectra of endogenous variables generated both by exogenous variables.

AUTO SPECTRA OF ENDOG. VAR. GENERATED BY EXOG. VAR.

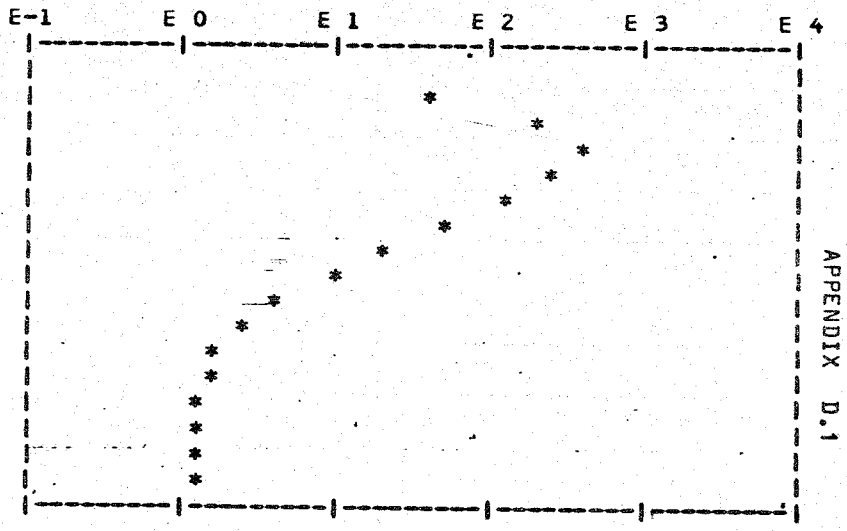
SERIES 1 C

I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.1138E 04	0.1138E 04	8.01	8.01
1	32.00	0.03	0.1853E 04	0.2991E 04	13.04	21.04
2	16.00	0.06	0.3632E 04	0.6623E 04	25.55	46.60
3	10.67	0.09	0.4035E 04	0.1066E 05	28.39	74.98
4	8.00	0.13	0.2272E 04	0.1293E 05	15.99	90.97
5	6.40	0.16	0.8323E 03	0.1376E 05	5.86	96.82
6	5.33	0.19	0.2705E 03	0.1403E 05	1.90	98.73
7	4.57	0.22	0.1031E 03	0.1414E 05	0.73	99.45
8	4.00	0.25	0.4040E 02	0.1418E 05	0.28	99.74
9	3.56	0.28	0.1449E 02	0.1419E 05	0.10	99.84
10	3.20	0.31	0.6718E 01	0.1420E 05	0.05	99.88
11	2.91	0.34	0.4173E 01	0.1420E 05	0.03	99.91
12	2.67	0.38	0.2898E 01	0.1420E 05	0.02	99.93
13	2.46	0.41	0.2526E 01	0.1421E 05	0.02	99.95
14	2.29	0.44	0.2474E 01	0.1421E 05	0.02	99.97
15	2.13	0.47	0.2246E 01	0.1421E 05	0.02	99.99
16	2.00	0.50	0.2066E 01	0.1421E 05	0.01	100.00



SERIES 2 I

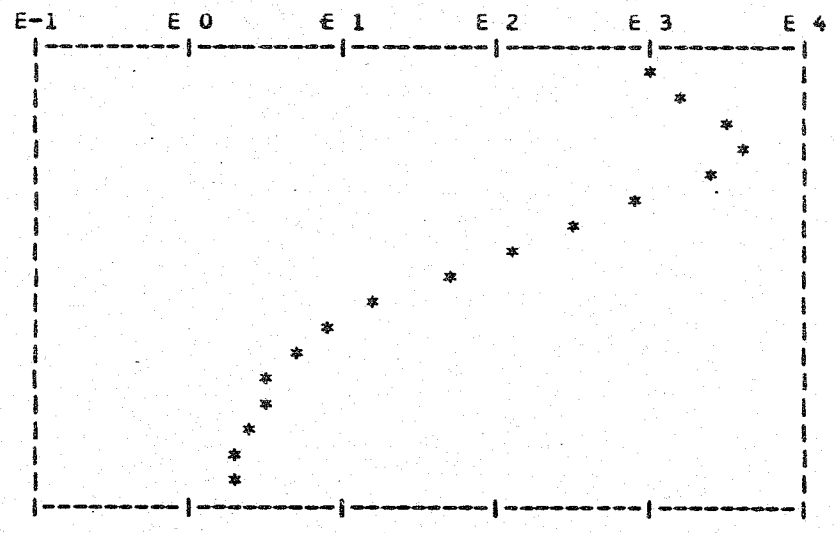
I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.4779E-10	0.4779E-10	0.00	0.00
1	32.00	0.03	0.3209E 02	0.3209E 02	3.29	3.29
2	16.00	0.06	0.1825E 03	0.2145E 03	18.70	21.99
3	10.67	0.09	0.3250E 03	0.5395E 03	33.32	55.31
4	8.00	0.13	0.2421E 03	0.7817E 03	24.82	80.13
5	6.40	0.16	0.1092E 03	0.8909E 03	11.20	91.33
6	5.33	0.19	0.4295E 02	0.9338E 03	4.40	95.73
7	4.57	0.22	0.1951E 02	0.9533E 03	2.00	97.73
8	4.00	0.25	0.8845E 01	0.9622E 03	0.91	98.64
9	3.56	0.28	0.3619E 01	0.9658E 03	0.37	99.01
10	3.20	0.31	0.2005E 01	0.9678E 03	0.21	99.21
11	2.91	0.34	0.1549E 01	0.9694E 03	0.16	99.37
12	2.67	0.38	0.1313E 01	0.9707E 03	0.13	99.51
13	2.46	0.41	0.1246E 01	0.9719E 03	0.13	99.63
14	2.29	0.44	0.1226E 01	0.9731E 03	0.13	99.76
15	2.13	0.47	0.1187E 01	0.9743E 03	0.12	99.88
16	2.00	0.50	0.1162E 01	0.9755E 03	0.12	100.00



AUTO SPECTRA OF ENDOG. VAR. GENERATED BY EXOG. VAR.

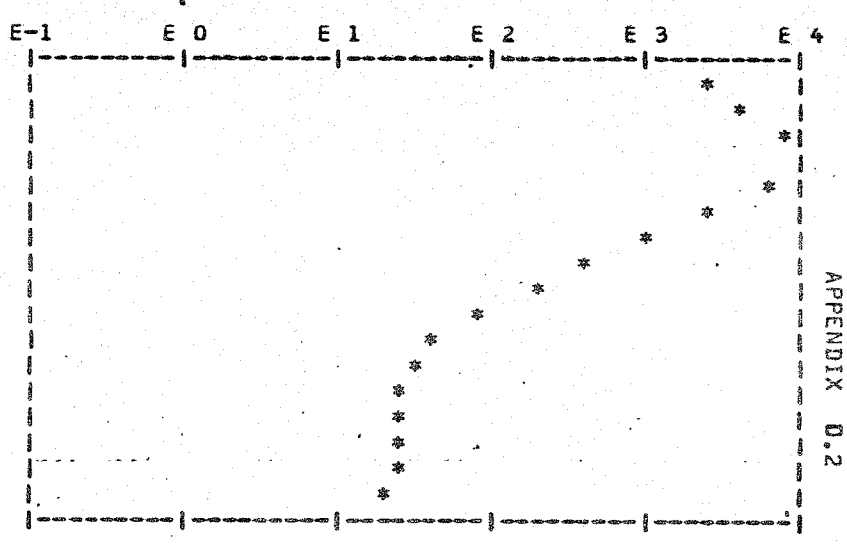
SERIES 3 W1

I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.8767E 03	0.8767E 03	7.41	7.41
1	32.00	0.03	0.1439E 04	0.2316E 04	12.17	19.59
2	16.00	0.06	0.2918E 04	0.5235E 04	24.68	44.27
3	10.67	0.09	0.3391E 04	0.8626E 04	28.68	72.94
4	8.00	0.13	0.1996E 04	0.1062E 05	16.88	89.82
5	6.40	0.16	0.7626E 03	0.1138E 05	6.45	96.27
6	5.33	0.19	0.2602E 03	0.1164E 05	2.20	98.47
7	4.57	0.22	0.1030E 03	0.1175E 05	0.87	99.34
8	4.00	0.25	0.4055E 02	0.1179E 05	0.34	99.69
9	3.56	0.28	0.1428E 02	0.1180E 05	0.12	99.81
10	3.20	0.31	0.6741E 01	0.1181E 05	0.06	99.86
11	2.91	0.34	0.4406E 01	0.1181E 05	0.04	99.90
12	2.67	0.38	0.3151E 01	0.1182E 05	0.03	99.93
13	2.46	0.41	0.2542E 01	0.1182E 05	0.02	99.95
14	2.29	0.44	0.2176E 01	0.1182E 05	0.02	99.97
15	2.13	0.47	0.1914E 01	0.1182E 05	0.02	99.98
16	2.00	0.50	0.1810E 01	0.1183E 05	0.02	100.00



SERIES 4 Y

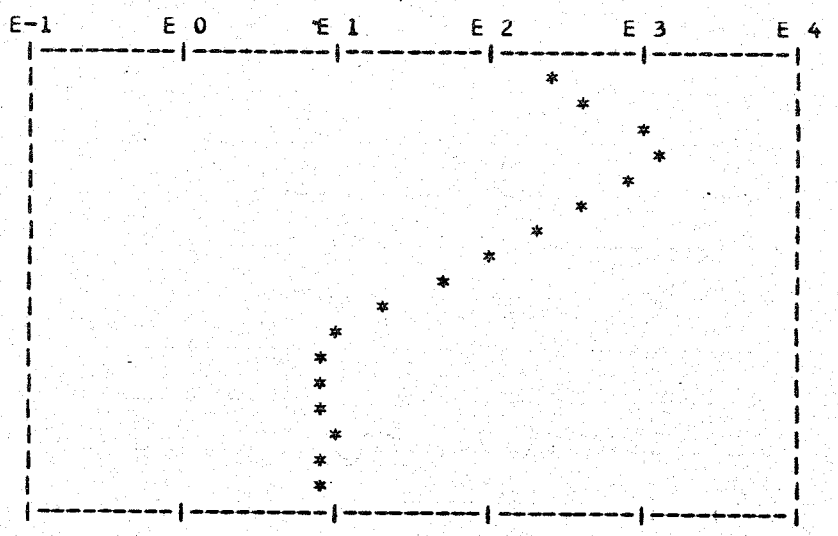
I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.2236E 04	0.2236E 04	7.13	7.13
1	32.00	0.03	0.3639E 04	0.5876E 04	11.60	18.73
2	16.00	0.06	0.7379E 04	0.1325E 05	23.52	42.25
3	10.67	0.09	0.8776E 04	0.2203E 05	27.97	70.22
4	8.00	0.13	0.5430E 04	0.2746E 05	17.31	87.53
5	6.40	0.16	0.2247E 04	0.2971E 05	7.16	94.69
6	5.33	0.19	0.8623E 03	0.3057E 05	2.75	97.44
7	4.57	0.22	0.3956E 03	0.3097E 05	1.26	98.70
8	4.00	0.25	0.1772E 03	0.3114E 05	0.56	99.27
9	3.56	0.28	0.6819E 02	0.3121E 05	0.22	99.48
10	3.20	0.31	0.3510E 02	0.3125E 05	0.11	99.59
11	2.91	0.34	0.2552E 02	0.3127E 05	0.08	99.68
12	2.67	0.38	0.2057E 02	0.3129E 05	0.07	99.74
13	2.46	0.41	0.2064E 02	0.3131E 05	0.07	99.81
14	2.29	0.44	0.2199E 02	0.3134E 05	0.07	99.88
15	2.13	0.47	0.2018E 02	0.3136E 05	0.06	99.94
16	2.00	0.50	0.1829E 02	0.3137E 05	0.06	100.00



AUTO SPECTRA OF ENDOG. VAR. GENERATED BY EXOG. VAR.

SERIES 5 P

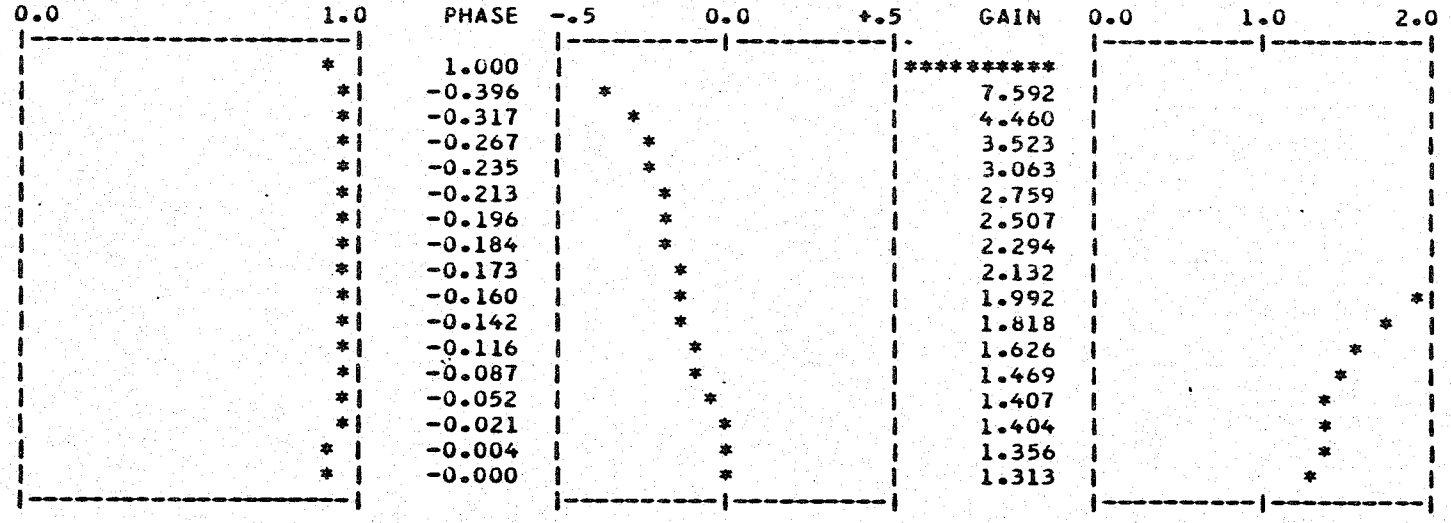
I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.2477E 03	0.2477E 03	6.18	6.18
1	32.00	0.03	0.3894E 03	0.6370E 03	9.72	15.90
2	16.00	0.06	0.8131E 03	0.1450E 04	20.29	36.19
3	10.67	0.09	0.1069E 04	0.2519E 04	26.67	62.87
4	8.00	0.13	0.7501E 03	0.3269E 04	18.72	81.59
5	6.40	0.16	0.3598E 03	0.3629E 04	8.98	90.57
6	5.33	0.19	0.1686E 03	0.3797E 04	4.21	94.78
7	4.57	0.22	0.9408E 02	0.3891E 04	2.35	97.12
8	4.00	0.25	0.4575E 02	0.3937E 04	1.14	98.27
9	3.56	0.28	0.1711E 02	0.3954E 04	0.43	98.69
10	3.20	0.31	0.8922E 01	0.3963E 04	0.22	98.92
11	2.91	0.34	0.7218E 01	0.3970E 04	0.18	99.10
12	2.67	0.38	0.6468E 01	0.3977E 04	0.16	99.26
13	2.46	0.41	0.7447E 01	0.3984E 04	0.19	99.44
14	2.29	0.44	0.8488E 01	0.3993E 04	0.21	99.66
15	2.13	0.47	0.7439E 01	0.4000E 04	0.19	99.84
16	2.00	0.50	0.6343E 01	0.4007E 04	0.16	100.00



CROSS SPECTRA OF ENDOG. VAR. GENERATED BY EXOG. VAR.

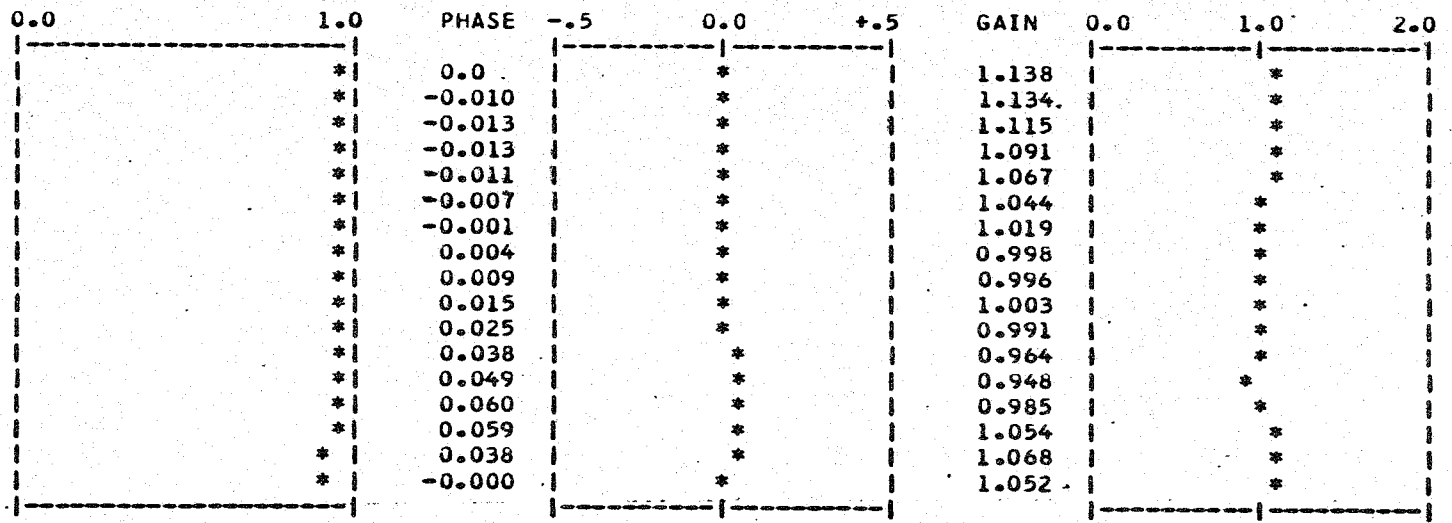
SERIES 1 C AND SERIES 2 I

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.944	1.000	**********
1	32.00	0.03	0.998	-0.396	7.592
2	16.00	0.06	0.999	-0.317	4.460
3	10.67	0.09	1.000	-0.267	3.523
4	8.00	0.13	1.000	-0.235	3.063
5	6.40	0.16	0.999	-0.213	2.759
6	5.33	0.19	0.998	-0.196	2.507
7	4.57	0.22	0.997	-0.184	2.294
8	4.00	0.25	0.995	-0.173	2.132
9	3.56	0.28	0.991	-0.160	1.992
10	3.20	0.31	0.986	-0.142	1.818
11	2.91	0.34	0.981	-0.116	1.626
12	2.67	0.38	0.977	-0.087	1.469
13	2.46	0.41	0.977	-0.052	1.407
14	2.29	0.44	0.976	-0.021	1.404
15	2.13	0.47	0.972	-0.004	1.356
16	2.00	0.50	0.970	-0.000	1.313



SERIES 1 C AND SERIES 3 W1

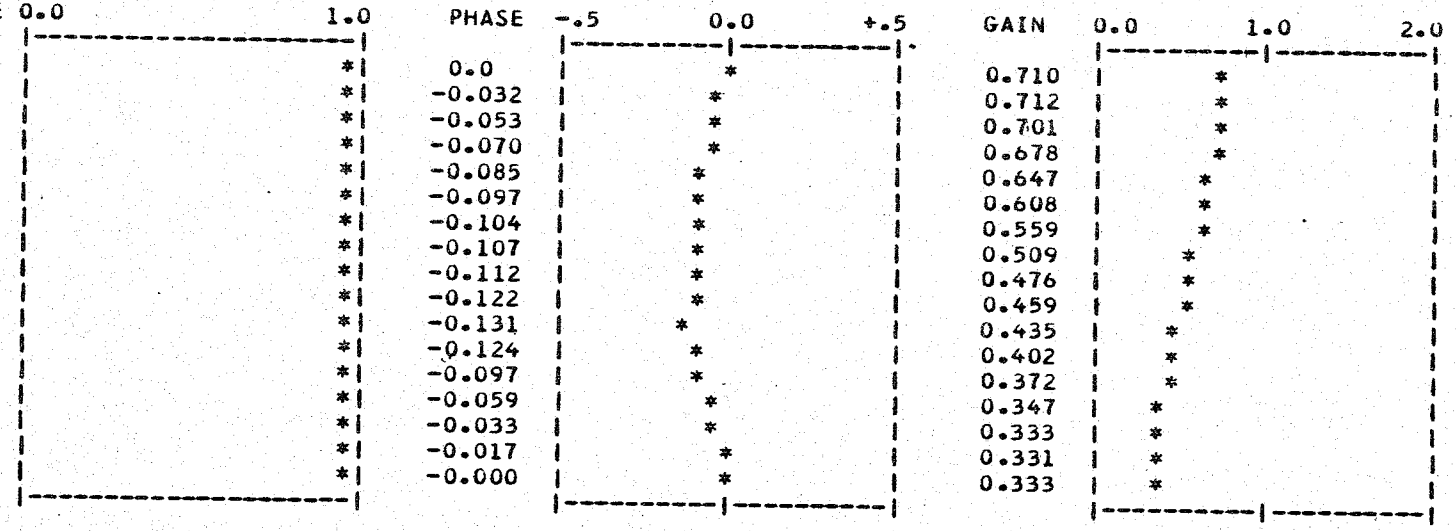
I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.997	0.0	1.138
1	32.00	0.03	0.998	-0.010	1.134
2	16.00	0.06	0.999	-0.013	1.115
3	10.67	0.09	1.000	-0.013	1.091
4	8.00	0.13	1.000	-0.011	1.067
5	6.40	0.16	0.999	-0.007	1.044
6	5.33	0.19	0.998	-0.001	1.019
7	4.57	0.22	0.997	0.004	0.998
8	4.00	0.25	0.995	0.009	0.996
9	3.56	0.28	0.991	0.015	1.003
10	3.20	0.31	0.986	0.025	0.991
11	2.91	0.34	0.981	0.038	0.964
12	2.67	0.38	0.977	0.049	0.948
13	2.46	0.41	0.977	0.060	0.985
14	2.29	0.44	0.976	0.059	1.054
15	2.13	0.47	0.972	0.038	1.068
16	2.00	0.50	0.970	-0.000	1.052



CROSS SPECTRA OF ENDOG. VAR. GENERATED BY EXOG. VAR.

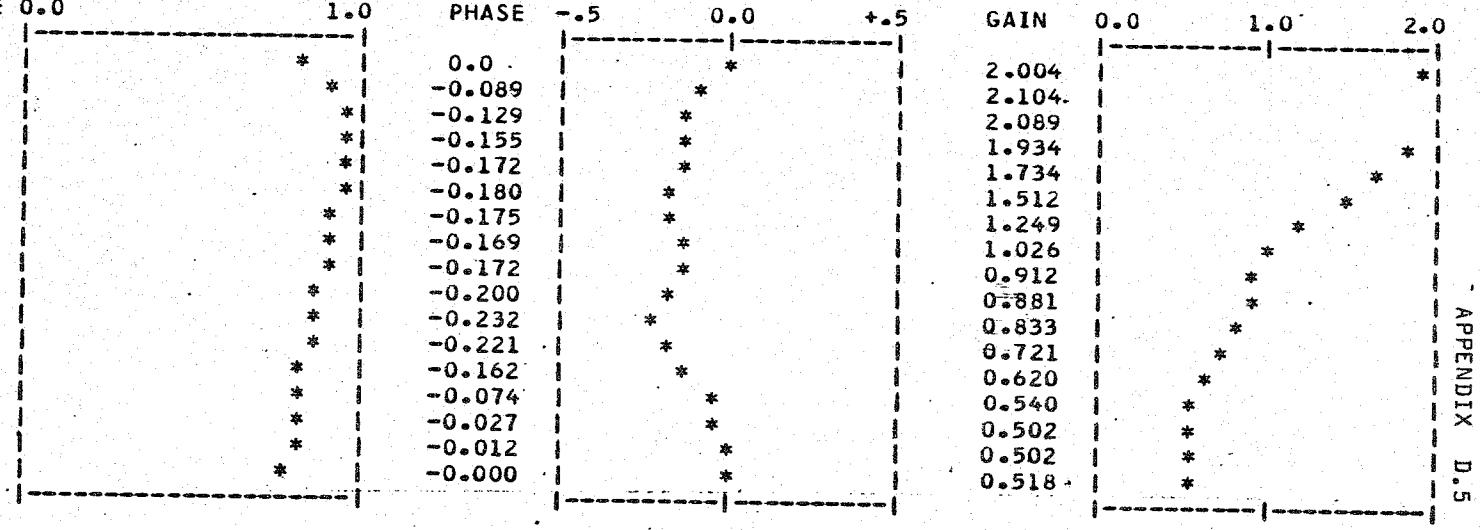
SERIES 1 C AND SERIES 4 Y

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.992	0.0	0.710
1	32.00	0.03	0.996	-0.032	0.712
2	16.00	0.06	0.999	-0.053	0.701
3	10.67	0.09	0.999	-0.070	0.678
4	8.00	0.13	0.999	-0.085	0.647
5	6.40	0.16	0.999	-0.097	0.608
6	5.33	0.19	0.997	-0.104	0.559
7	4.57	0.22	0.995	-0.107	0.509
8	4.00	0.25	0.992	-0.112	0.476
9	3.56	0.28	0.990	-0.122	0.459
10	3.20	0.31	0.991	-0.131	0.435
11	2.91	0.34	0.987	-0.124	0.402
12	2.67	0.38	0.982	-0.097	0.372
13	2.46	0.41	0.982	-0.059	0.347
14	2.29	0.44	0.983	-0.033	0.333
15	2.13	0.47	0.983	-0.017	0.331
16	2.00	0.50	0.983	-0.000	0.333



SERIES 1 C AND SERIES 5 P

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.874	0.0	2.004
1	32.00	0.03	0.930	-0.089	2.104
2	16.00	0.06	0.976	-0.129	2.089
3	10.67	0.09	0.990	-0.155	1.934
4	8.00	0.13	0.993	-0.172	1.734
5	6.40	0.16	0.988	-0.180	1.512
6	5.33	0.19	0.973	-0.175	1.249
7	4.57	0.22	0.960	-0.169	1.026
8	4.00	0.25	0.942	-0.172	0.912
9	3.56	0.28	0.917	-0.200	0.881
10	3.20	0.31	0.922	-0.232	0.833
11	2.91	0.34	0.899	-0.221	0.721
12	2.67	0.38	0.857	-0.162	0.620
13	2.46	0.41	0.860	-0.074	0.540
14	2.29	0.44	0.863	-0.027	0.502
15	2.13	0.47	0.836	-0.012	0.502
16	2.00	0.50	0.825	-0.000	0.518

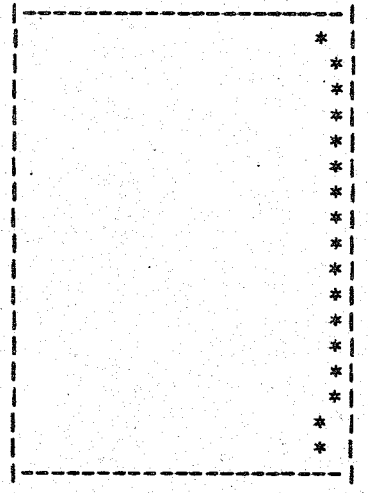


CROSS SPECTRA OF ENDOG. VAR. GENERATED BY EXOG. VAR.

SERIES 2 I AND SERIES 1 C

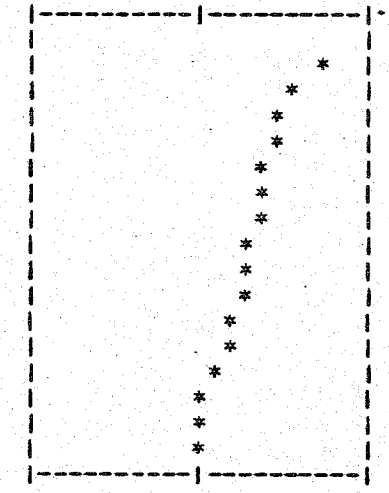
I	T(I)	L(I)	COHERENCE
0	999.99	0.0	0.944
1	32.00	0.03	0.998
2	16.00	0.06	0.999
3	10.67	0.09	1.000
4	8.00	0.13	1.000
5	6.40	0.16	0.999
6	5.33	0.19	0.998
7	4.57	0.22	0.997
8	4.00	0.25	0.995
9	3.56	0.28	0.991
10	3.20	0.31	0.986
11	2.91	0.34	0.981
12	2.67	0.38	0.977
13	2.46	0.41	0.977
14	2.29	0.44	0.976
15	2.13	0.47	0.972
16	2.00	0.50	0.970

COHERENCE 0.0 1.0



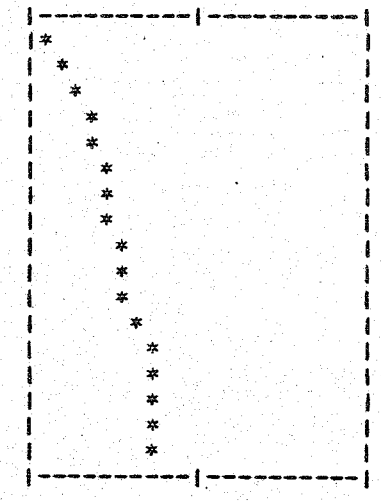
PHASE
1.000
0.396
0.317
0.267
0.235
0.213
0.196
0.184
0.173
0.160
0.142
0.116
0.087
0.052
0.021
0.004
0.000

PHASE -.5 0.0 +.5



GAIN
0.000
0.131
0.224
0.284
0.326
0.362
0.398
0.434
0.467
0.497
0.542
0.603
0.665
0.694
0.695
0.717
0.738

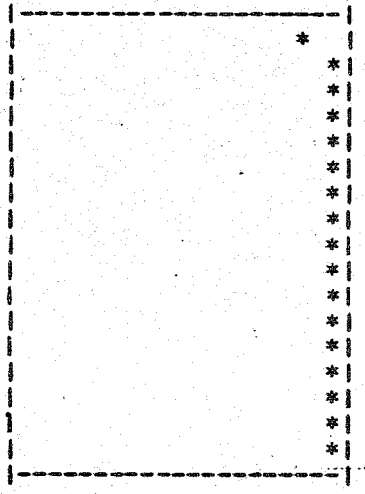
GAIN 0.0 1.0 2.0



SERIES 2 I AND SERIES 3 W1

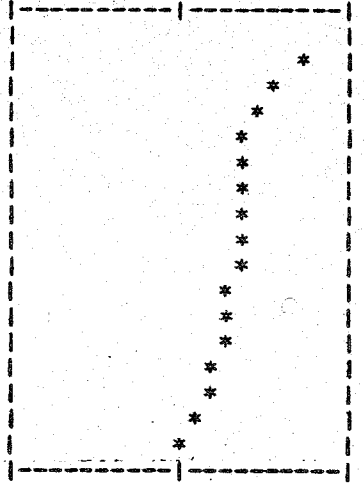
I	T(I)	L(I)	COHERENCE
0	999.99	0.0	0.918
1	32.00	0.03	1.000
2	16.00	0.06	1.000
3	10.67	0.09	1.000
4	8.00	0.13	1.000
5	6.40	0.16	1.000
6	5.33	0.19	1.000
7	4.57	0.22	1.000
8	4.00	0.25	1.000
9	3.56	0.28	1.000
10	3.20	0.31	1.000
11	2.91	0.34	1.000
12	2.67	0.38	1.000
13	2.46	0.41	1.000
14	2.29	0.44	1.000
15	2.13	0.47	1.000
16	2.00	0.50	1.000

COHERENCE 0.0 1.0



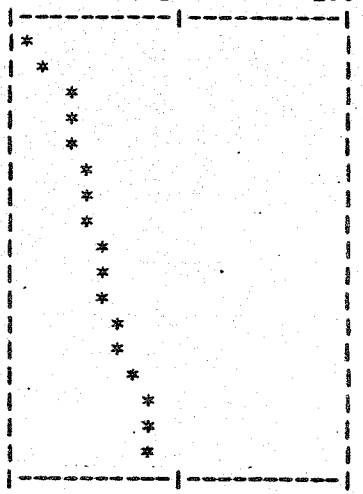
PHASE
1.000
0.386
0.304
0.253
0.224
0.206
0.196
0.188
0.182
0.175
0.166
0.154
0.136
0.112
0.080
0.042
0.000

PHASE -.5 0.0 +.5



GAIN
0.000
0.149
0.250
0.310
0.348
0.378
0.406
0.435
0.467
0.503
0.545
0.593
0.646
0.700
0.751
0.787
0.801

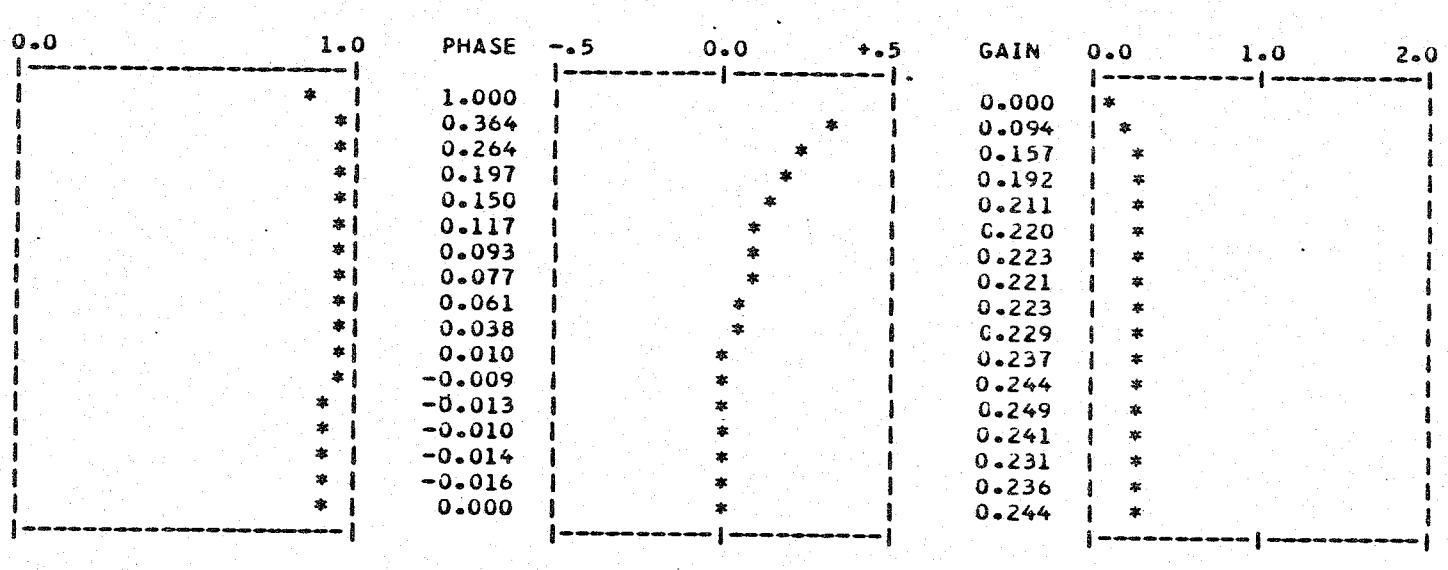
GAIN 0.0 1.0 2.0



CROSS SPECTRA OF ENDOG. VAR. GENERATED BY EXOG. VAR.

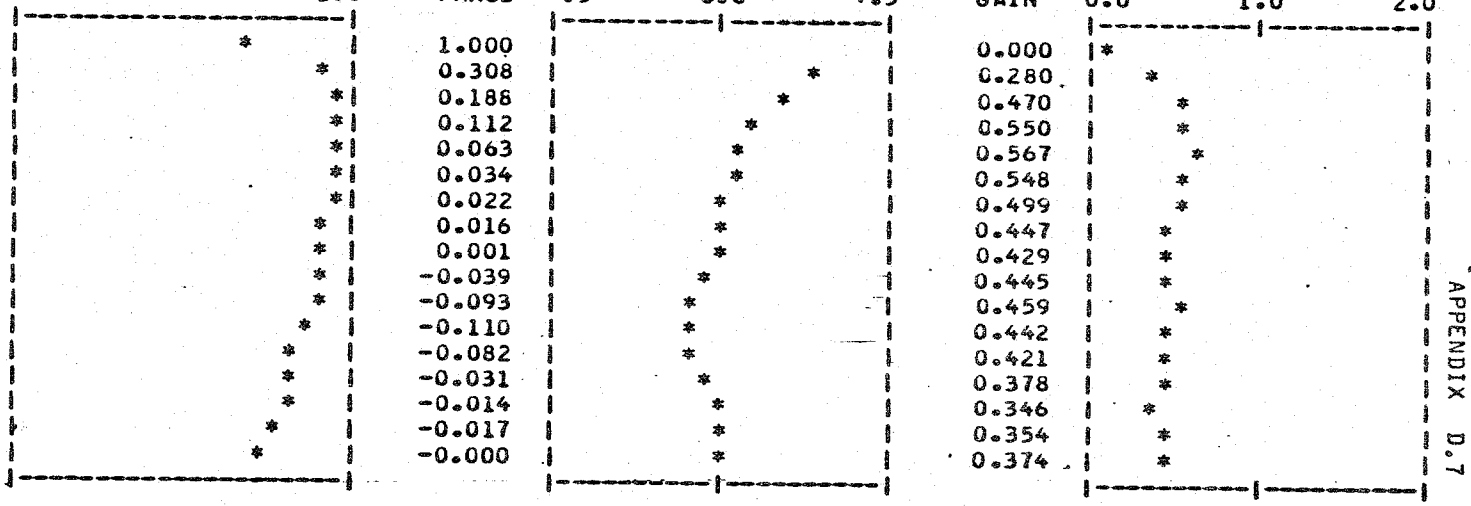
SERIES 2 I AND SERIES 4 Y

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.896	1.000	0.000
1	32.00	0.03	0.999	0.364	0.094
2	16.00	0.06	1.000	0.264	0.157
3	10.67	0.09	1.000	0.197	0.192
4	8.00	0.13	1.000	0.150	0.211
5	6.40	0.16	0.999	0.117	0.220
6	5.33	0.19	0.997	0.093	0.223
7	4.57	0.22	0.994	0.077	0.221
8	4.00	0.25	0.993	0.061	0.223
9	3.56	0.28	0.991	0.038	0.229
10	3.20	0.31	0.986	0.010	0.237
11	2.91	0.34	0.978	-0.009	0.244
12	2.67	0.38	0.972	-0.013	0.249
13	2.46	0.41	0.966	-0.010	0.241
14	2.29	0.44	0.958	-0.014	0.231
15	2.13	0.47	0.946	-0.016	0.236
16	2.00	0.50	0.940	0.000	0.244



SERIES 2 I AND SERIES 5 P

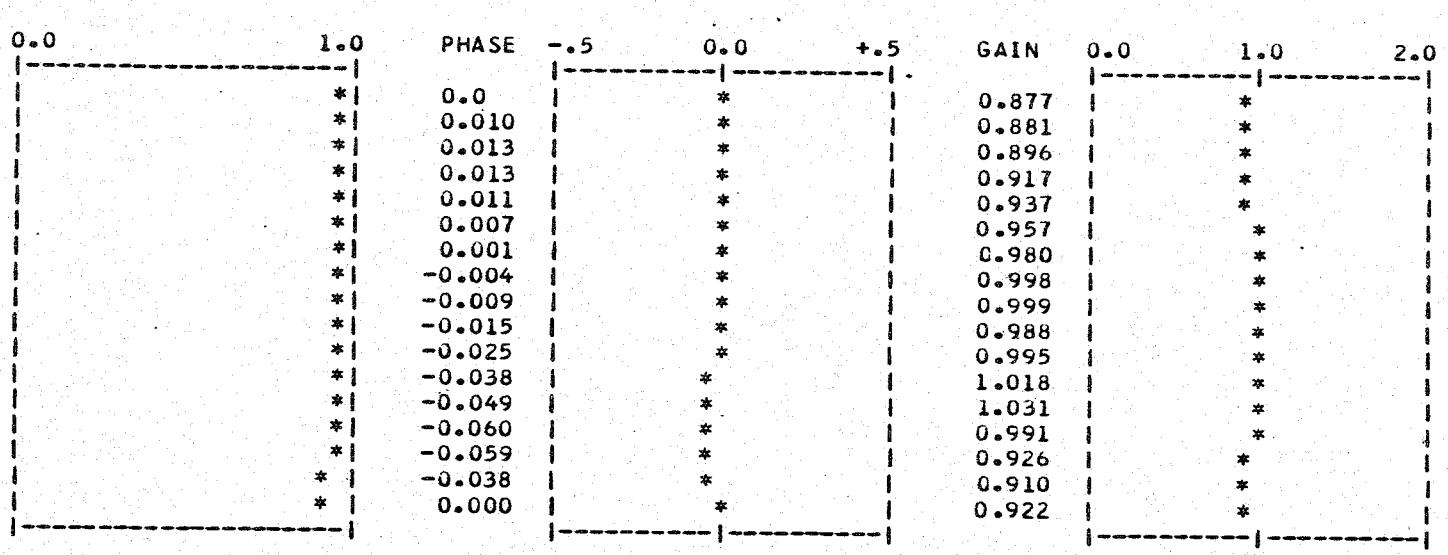
I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.681	1.000	0.000
1	32.00	0.03	0.948	0.308	0.280
2	16.00	0.06	0.983	0.188	0.470
3	10.67	0.09	0.993	0.112	0.550
4	8.00	0.13	0.995	0.063	0.567
5	6.40	0.16	0.991	0.034	0.548
6	5.33	0.19	0.976	0.022	0.499
7	4.57	0.22	0.965	0.016	0.447
8	4.00	0.25	0.953	0.001	0.429
9	3.56	0.28	0.936	-0.039	0.445
10	3.20	0.31	0.936	-0.093	0.459
11	2.91	0.34	0.911	-0.110	0.442
12	2.67	0.38	0.871	-0.082	0.421
13	2.46	0.41	0.853	-0.031	0.378
14	2.29	0.44	0.831	-0.014	0.346
15	2.13	0.47	0.784	-0.017	0.354
16	2.00	0.50	0.762	-0.000	0.374



CROSS SPECTRA OF ENDOG. VAR. GENERATED BY EXOG. VAR.

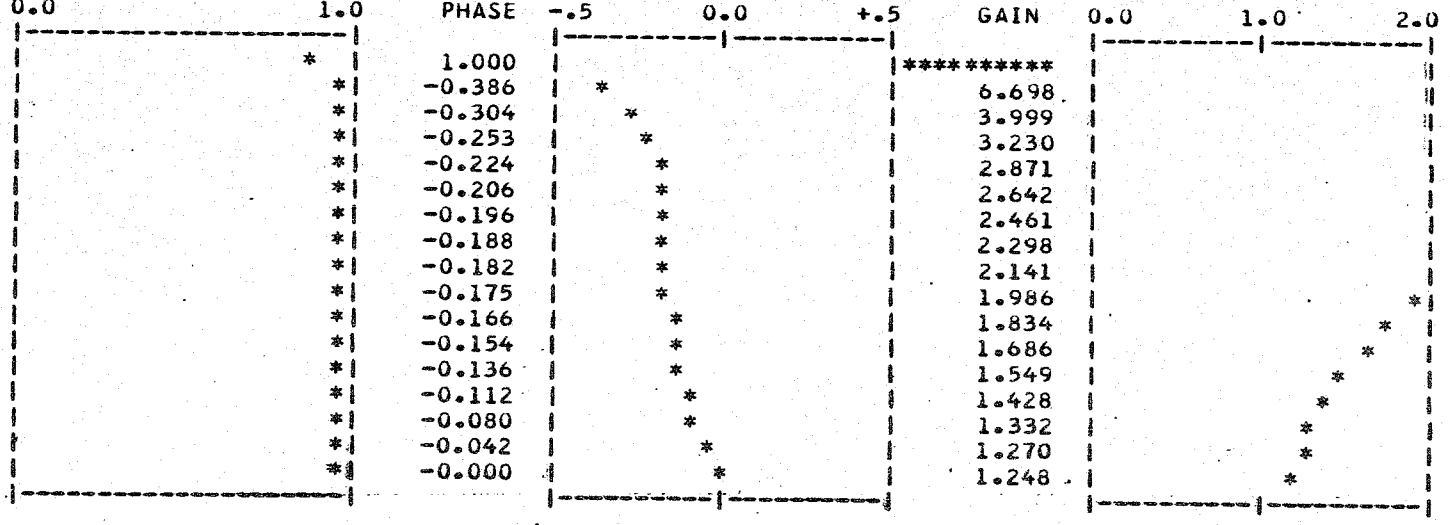
SERIES 3 W1 AND SERIES 1 C

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.997	0.0	0.877
1	32.00	0.03	0.998	0.010	0.881
2	16.00	0.06	0.999	0.013	0.896
3	10.67	0.09	1.000	0.013	0.917
4	8.00	0.13	1.000	0.011	0.937
5	6.40	0.16	0.999	0.007	0.957
6	5.33	0.19	0.998	0.001	0.980
7	4.57	0.22	0.997	-0.004	0.998
8	4.00	0.25	0.995	-0.009	0.999
9	3.56	0.28	0.991	-0.015	0.988
10	3.20	0.31	0.986	-0.025	0.995
11	2.91	0.34	0.981	-0.038	1.018
12	2.67	0.38	0.977	-0.049	1.031
13	2.46	0.41	0.977	-0.060	0.991
14	2.29	0.44	0.976	-0.059	0.926
15	2.13	0.47	0.972	-0.038	0.910
16	2.00	0.50	0.970	0.000	0.922



SERIES 3 W1 AND SERIES 2 I

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.918	1.000	**********
1	32.00	0.03	1.000	-0.386	6.698
2	16.00	0.06	1.000	-0.304	3.999
3	10.67	0.09	1.000	-0.253	3.230
4	8.00	0.13	1.000	-0.224	2.871
5	6.40	0.16	1.000	-0.206	2.642
6	5.33	0.19	1.000	-0.196	2.461
7	4.57	0.22	1.000	-0.188	2.298
8	4.00	0.25	1.000	-0.182	2.141
9	3.56	0.28	1.000	-0.175	1.986
10	3.20	0.31	1.000	-0.166	1.834
11	2.91	0.34	1.000	-0.154	1.686
12	2.67	0.38	1.000	-0.136	1.549
13	2.46	0.41	1.000	-0.112	1.428
14	2.29	0.44	1.000	-0.080	1.332
15	2.13	0.47	1.000	-0.042	1.270
16	2.00	0.50	1.000	-0.000	1.248



CROSS SPECTRA OF ENDOG. VAR. GENERATED BY EXOG. VAR.

SERIES 3 W1 AND SERIES 4 Y

I	T(I)	L(I)	COHERENCE
0	999.99	0.0	0.998
1	32.00	0.03	0.999
2	16.00	0.06	1.000
3	10.67	0.09	1.000
4	8.00	0.13	1.000
5	6.40	0.16	0.999
6	5.33	0.19	0.997
7	4.57	0.22	0.994
8	4.00	0.25	0.993
9	3.56	0.28	0.991
10	3.20	0.31	0.986
11	2.91	0.34	0.978
12	2.67	0.38	0.972
13	2.46	0.41	0.966
14	2.29	0.44	0.958
15	2.13	0.47	0.946
16	2.00	0.50	0.940

COHERENCE 0.0 — 1.0

PHASE
0.0
-0.022
-0.040
-0.057
-0.074
-0.090
-0.103
-0.112
-0.121
-0.137
-0.157
-0.163
-0.149
-0.121
-0.095
-0.058
0.000

PHASE -.5 — 0.0 — +.5

GAIN
0.626
0.629
0.629
0.622
0.606
0.582
0.548
0.509
0.477
0.455
0.435
0.411
0.386
0.345
0.308
0.300
0.305

GAIN 0.0 — 1.0 — 2.0

SERIES 3 W1 AND SERIES 5 P

I	T(I)	L(I)	COHERENCE
0	999.99	0.0	0.906
1	32.00	0.03	0.948
2	16.00	0.06	0.983
3	10.67	0.09	0.993
4	8.00	0.13	0.995
5	6.40	0.16	0.991
6	5.33	0.19	0.976
7	4.57	0.22	0.965
8	4.00	0.25	0.953
9	3.56	0.28	0.936
10	3.20	0.31	0.936
11	2.91	0.34	0.911
12	2.67	0.38	0.871
13	2.46	0.41	0.853
14	2.29	0.44	0.831
15	2.13	0.47	0.784
16	2.00	0.50	0.762

COHERENCE 0.0 — 1.0

PHASE
0.0
-0.078
-0.116
-0.141
-0.161
-0.173
-0.174
-0.172
-0.181
-0.215
-0.259
-0.264
-0.218
-0.142
-0.094
-0.059
-0.000

PHASE -.5 — 0.0 — +.5

GAIN
1.791
1.872
1.878
1.775
1.627
1.449
1.227
1.028
0.919
0.884
0.841
0.746
0.652
0.540
0.461
0.449
0.466

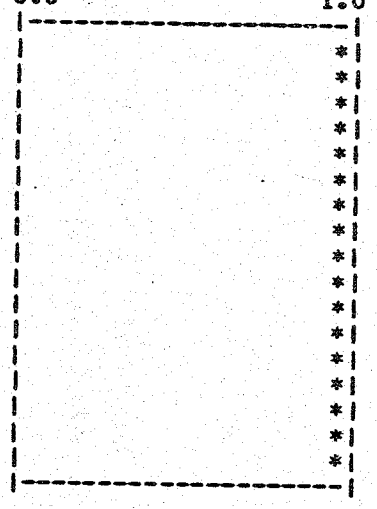
GAIN 0.0 — 1.0 — 2.0

CROSS SPECTRA OF ENDOG. VAR. GENERATED BY EXOG. VAR.

SERIES 4 Y AND SERIES 1 C

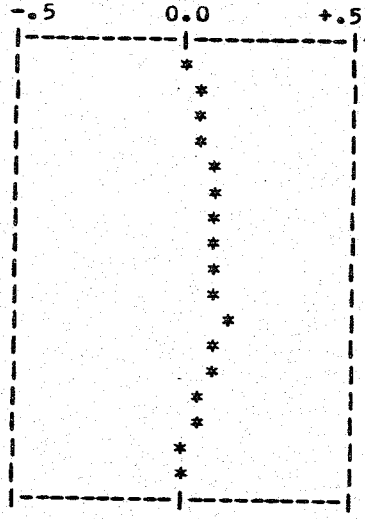
I	T(I)	L(I)	COHERENCE
0	999.99	0.0	0.992
1	32.00	0.03	0.996
2	16.00	0.06	0.999
3	10.67	0.09	0.999
4	8.00	0.13	0.999
5	6.40	0.16	0.999
6	5.33	0.19	0.997
7	4.57	0.22	0.995
8	4.00	0.25	0.992
9	3.56	0.28	0.990
10	3.20	0.31	0.991
11	2.91	0.34	0.987
12	2.67	0.38	0.982
13	2.46	0.41	0.982
14	2.29	0.44	0.983
15	2.13	0.47	0.983
16	2.00	0.50	0.983

COHERENCE 0.0 — 1.0



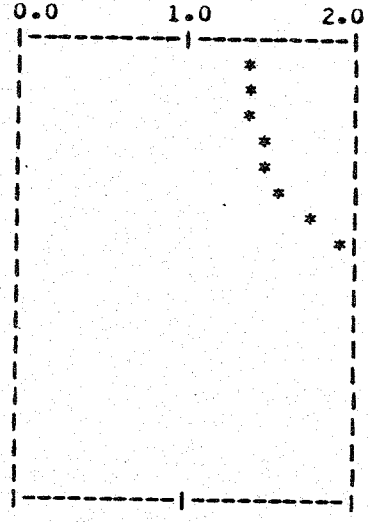
PHASE
0.0
0.032
0.053
0.070
0.085
0.097
0.104
0.107
0.112
0.122
0.131
0.124
0.097
0.059
0.033
0.017
0.000

PHASE -.5 — 0.0 — +.5



GAIN
1.396
1.398
1.424
1.474
1.545
1.642
1.783
1.954
2.086
2.158
2.275
2.458
2.640
2.833
2.956
2.971
2.951

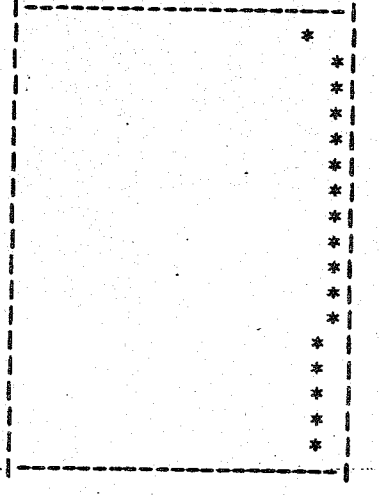
GAIN 0.0 — 1.0 — 2.0



SERIES 4 Y AND SERIES 2 I

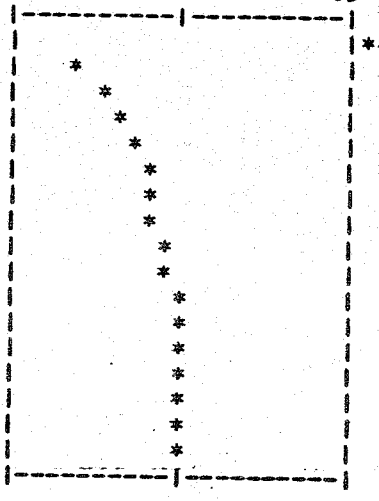
I	T(I)	L(I)	COHERENCE
0	999.99	0.0	0.896
1	32.00	0.03	0.999
2	16.00	0.06	1.000
3	10.67	0.09	1.000
4	8.00	0.13	1.000
5	6.40	0.16	0.999
6	5.33	0.19	0.997
7	4.57	0.22	0.994
8	4.00	0.25	0.993
9	3.56	0.28	0.991
10	3.20	0.31	0.986
11	2.91	0.34	0.978
12	2.67	0.38	0.972
13	2.46	0.41	0.966
14	2.29	0.44	0.958
15	2.13	0.47	0.946
16	2.00	0.50	0.940

COHERENCE 0.0 — 1.0



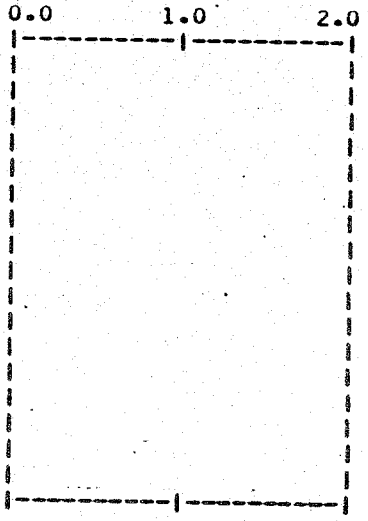
PHASE
1.000
-0.364
-0.264
-0.197
-0.150
-0.117
-0.093
-0.077
-0.061
-0.038
-0.010
0.009
0.013
0.010
0.014
0.016
-0.000

PHASE -.5 — 0.0 — +.5



GAIN
****
10.645.
6.358
5.196
4.735
4.534
4.474
4.490
4.460
4.321
4.154
4.014
3.902
4.000
4.145
4.011
3.849

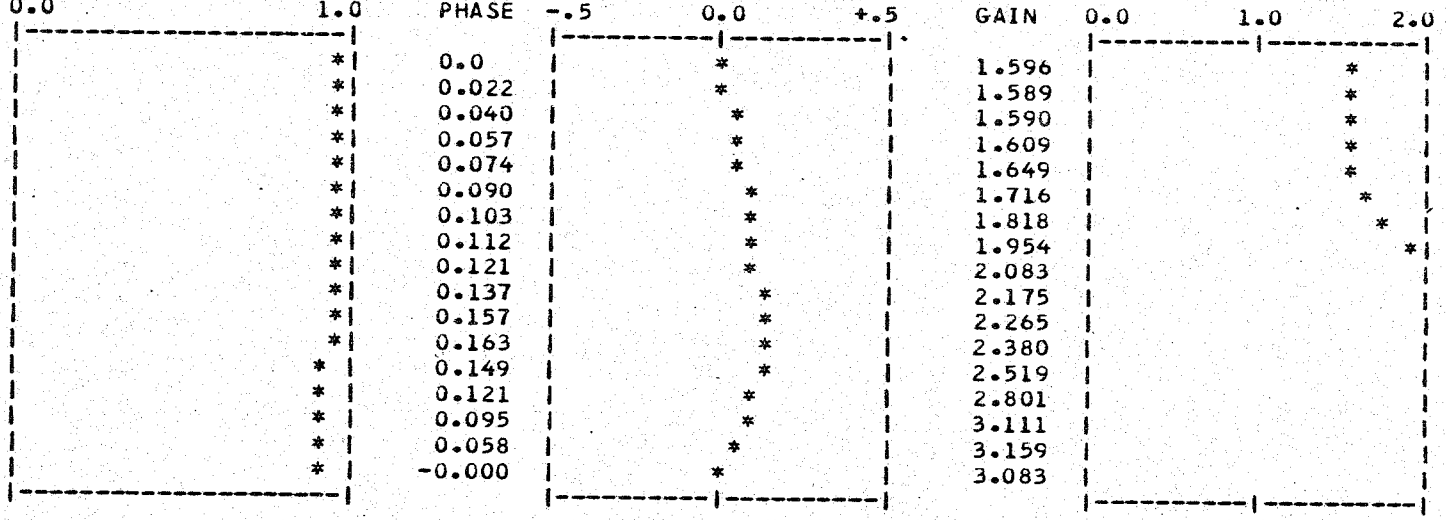
GAIN 0.0 — 1.0 — 2.0



CROSS SPECTRA OF ENDOG. VAR. GENERATED BY EXOG. VAR.

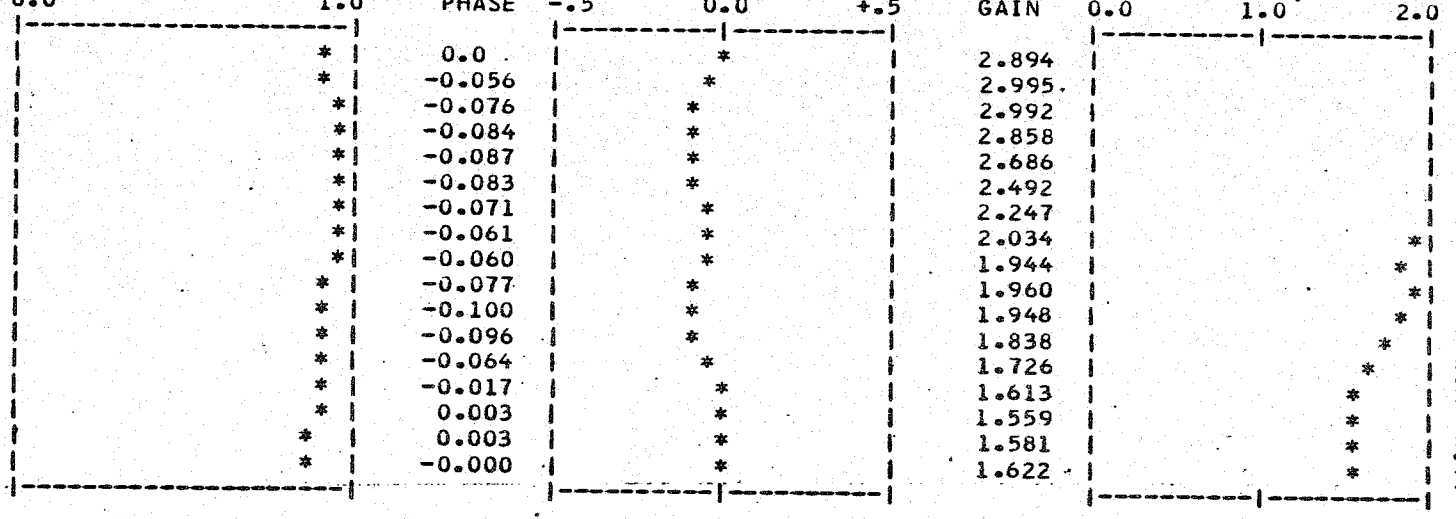
SERIES 4 Y AND SERIES 3 W1

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.998	0.0	1.596
1	32.00	0.03	0.999	0.022	1.589
2	16.00	0.06	1.000	0.040	1.590
3	10.67	0.09	1.000	0.057	1.609
4	8.00	0.13	1.000	0.074	1.649
5	6.40	0.16	0.999	0.090	1.716
6	5.33	0.19	0.997	0.103	1.818
7	4.57	0.22	0.994	0.112	1.954
8	4.00	0.25	0.993	0.121	2.083
9	3.56	0.28	0.991	0.137	2.175
10	3.20	0.31	0.986	0.157	2.265
11	2.91	0.34	0.978	0.163	2.380
12	2.67	0.38	0.972	0.149	2.519
13	2.46	0.41	0.966	0.121	2.801
14	2.29	0.44	0.958	0.095	3.111
15	2.13	0.47	0.946	0.058	3.159
16	2.00	0.50	0.940	-0.000	3.083



SERIES 4 Y AND SERIES 5 P

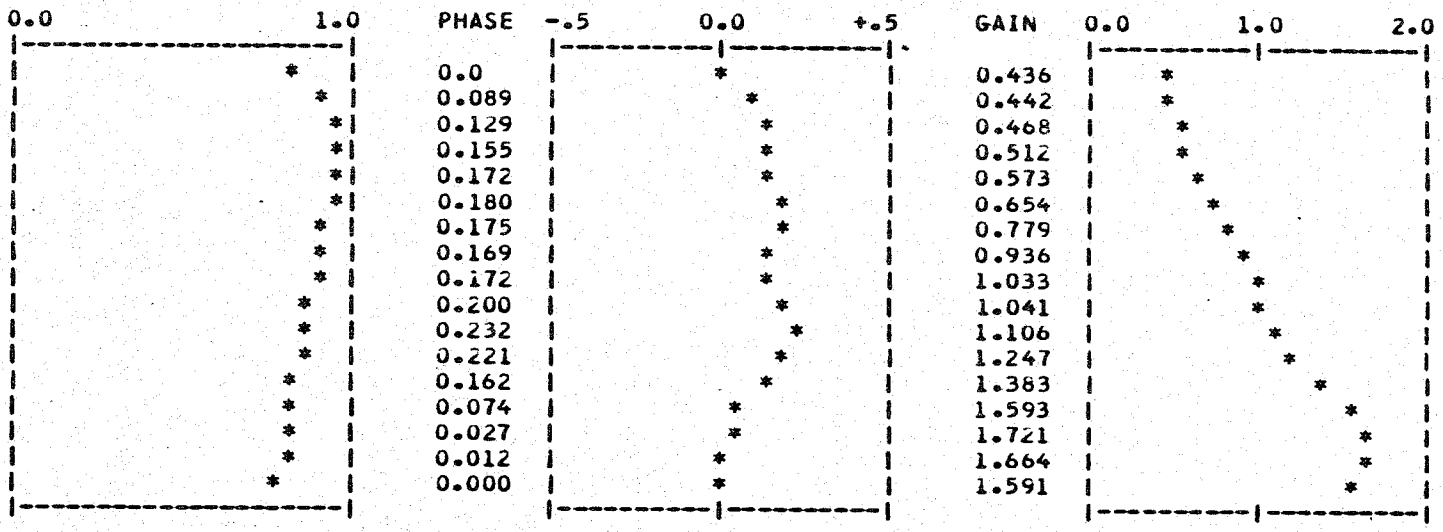
I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.928	0.0	2.894
1	32.00	0.03	0.959	-0.056	2.995
2	16.00	0.06	0.987	-0.076	2.992
3	10.67	0.09	0.995	-0.084	2.858
4	8.00	0.13	0.996	-0.087	2.686
5	6.40	0.16	0.994	-0.083	2.492
6	5.33	0.19	0.987	-0.071	2.247
7	4.57	0.22	0.983	-0.061	2.034
8	4.00	0.25	0.976	-0.060	1.944
9	3.56	0.28	0.964	-0.077	1.960
10	3.20	0.31	0.965	-0.100	1.948
11	2.91	0.34	0.955	-0.096	1.838
12	2.67	0.38	0.937	-0.064	1.726
13	2.46	0.41	0.939	-0.017	1.613
14	2.29	0.44	0.938	0.003	1.559
15	2.13	0.47	0.921	0.003	1.581
16	2.00	0.50	0.912	-0.000	1.622



CROSS SPECTRA OF ENDOG. VAR. GENERATED BY EXOG. VAR.

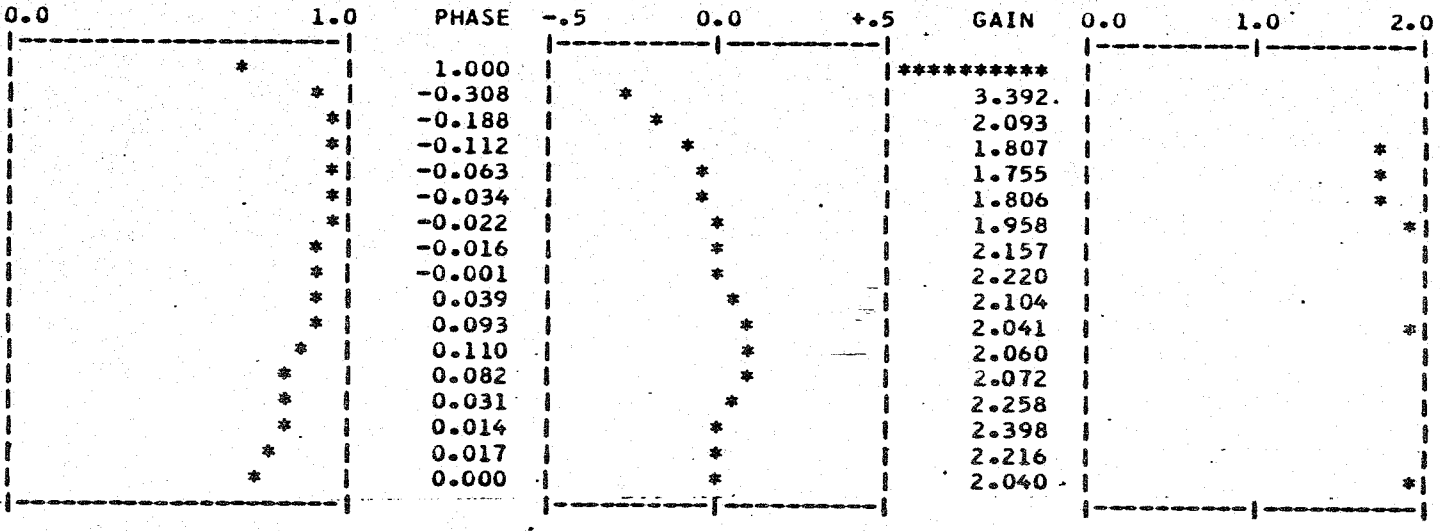
SERIES 5 P AND SERIES 1 C

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.874	0.0	0.436
1	32.00	0.03	0.930	0.089	0.442
2	16.00	0.06	0.976	0.129	0.468
3	10.67	0.09	0.990	0.155	0.512
4	8.00	0.13	0.993	0.172	0.573
5	6.40	0.16	0.988	0.180	0.654
6	5.33	0.19	0.973	0.175	0.779
7	4.57	0.22	0.960	0.169	0.936
8	4.00	0.25	0.942	0.172	1.033
9	3.56	0.28	0.917	0.200	1.041
10	3.20	0.31	0.922	0.232	1.106
11	2.91	0.34	0.899	0.221	1.247
12	2.67	0.38	0.857	0.162	1.383
13	2.46	0.41	0.860	0.074	1.593
14	2.29	0.44	0.863	0.027	1.721
15	2.13	0.47	0.836	0.012	1.664
16	2.00	0.50	0.825	0.000	1.591



SERIES 5 P AND SERIES 2 I

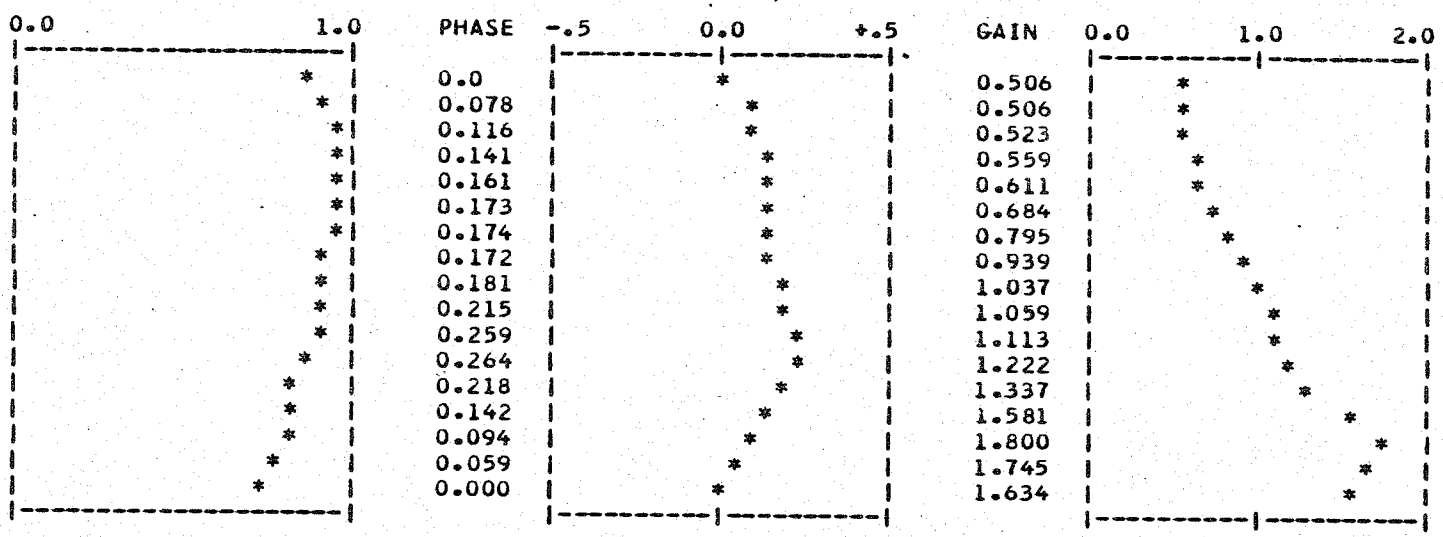
I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.681	1.000	**********
1	32.00	0.03	0.948	-0.308	3.392.
2	16.00	0.06	0.983	-0.188	2.093
3	10.67	0.09	0.993	-0.112	1.807
4	8.00	0.13	0.995	-0.063	1.755
5	6.40	0.16	0.991	-0.034	1.806
6	5.33	0.19	0.976	-0.022	1.958
7	4.57	0.22	0.965	-0.016	2.157
8	4.00	0.25	0.953	-0.001	2.220
9	3.56	0.28	0.936	0.039	2.104
10	3.20	0.31	0.936	0.093	2.041
11	2.91	0.34	0.911	0.110	2.060
12	2.67	0.38	0.871	0.082	2.072
13	2.46	0.41	0.853	0.031	2.258
14	2.29	0.44	0.831	0.014	2.398
15	2.13	0.47	0.784	0.017	2.216
16	2.00	0.50	0.762	0.000	2.040



CROSS SPECTRA OF ENDOG. VAR. GENERATED BY EXOG. VAR.

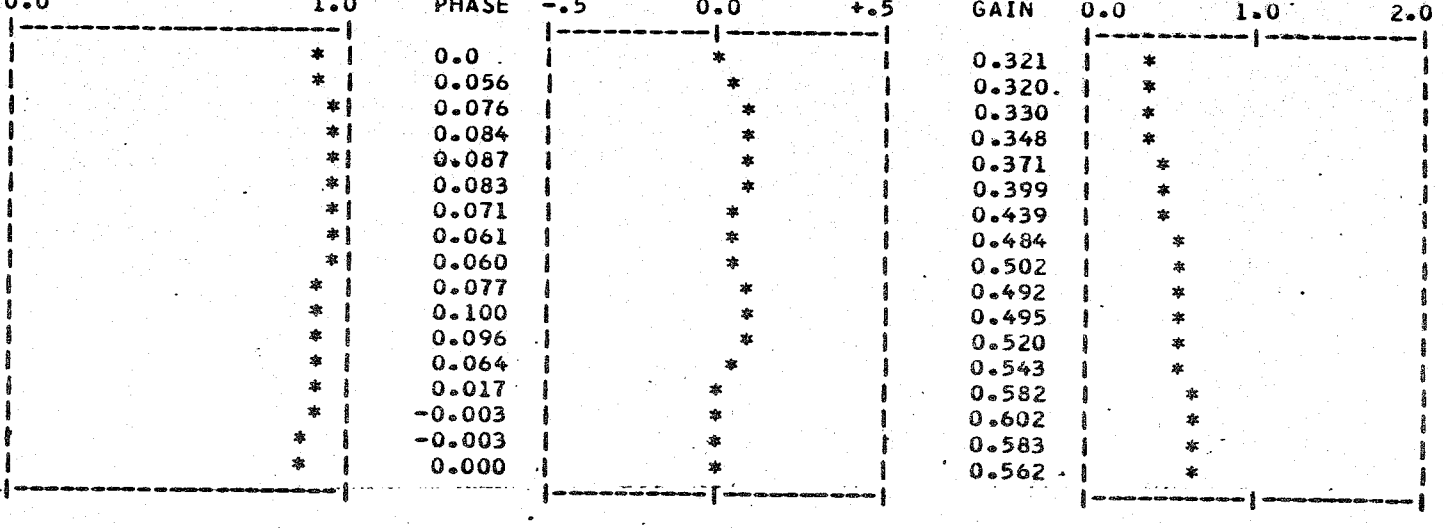
SERIES 5 P AND SERIES 3 W1

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.906	0.0	0.506
1	32.00	0.03	0.948	0.078	0.506
2	16.00	0.06	0.983	0.116	0.523
3	10.67	0.09	0.993	0.141	0.559
4	8.00	0.13	0.995	0.161	0.611
5	6.40	0.16	0.991	0.173	0.684
6	5.33	0.19	0.976	0.174	0.795
7	4.57	0.22	0.965	0.172	0.939
8	4.00	0.25	0.953	0.181	1.037
9	3.56	0.28	0.936	0.215	1.059
10	3.20	0.31	0.936	0.259	1.113
11	2.91	0.34	0.911	0.264	1.222
12	2.67	0.38	0.871	0.218	1.337
13	2.46	0.41	0.853	0.142	1.581
14	2.29	0.44	0.831	0.094	1.800
15	2.13	0.47	0.784	0.059	1.745
16	2.00	0.50	0.762	0.000	1.634



SERIES 5 P AND SERIES 4 Y

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.928	0.0	0.321
1	32.00	0.03	0.959	0.056	0.320
2	16.00	0.06	0.987	0.076	0.330
3	10.67	0.09	0.995	0.084	0.348
4	8.00	0.13	0.996	0.087	0.371
5	6.40	0.16	0.994	0.083	0.399
6	5.33	0.19	0.987	0.071	0.439
7	4.57	0.22	0.983	0.061	0.484
8	4.00	0.25	0.976	0.060	0.502
9	3.56	0.28	0.964	0.077	0.492
10	3.20	0.31	0.965	0.100	0.495
11	2.91	0.34	0.955	0.096	0.520
12	2.67	0.38	0.937	0.064	0.543
13	2.46	0.41	0.939	0.017	0.582
14	2.29	0.44	0.938	-0.003	0.602
15	2.13	0.47	0.921	-0.003	0.583
16	2.00	0.50	0.912	0.000	0.562



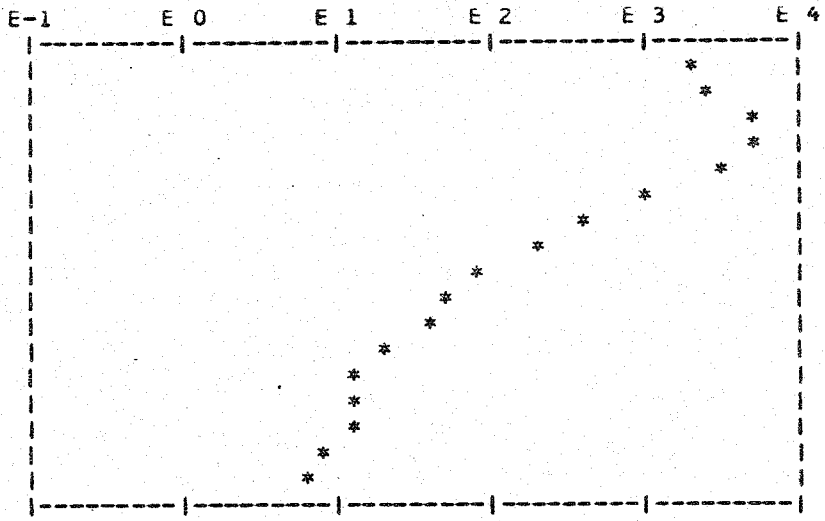
APPENDIX E:

Spectra of endogenous variables generated by exogenous variables and residuals.

AUTO SPECTRA OF ENDOG. VAR. GEN. BY EXOG. VAR. & RES.

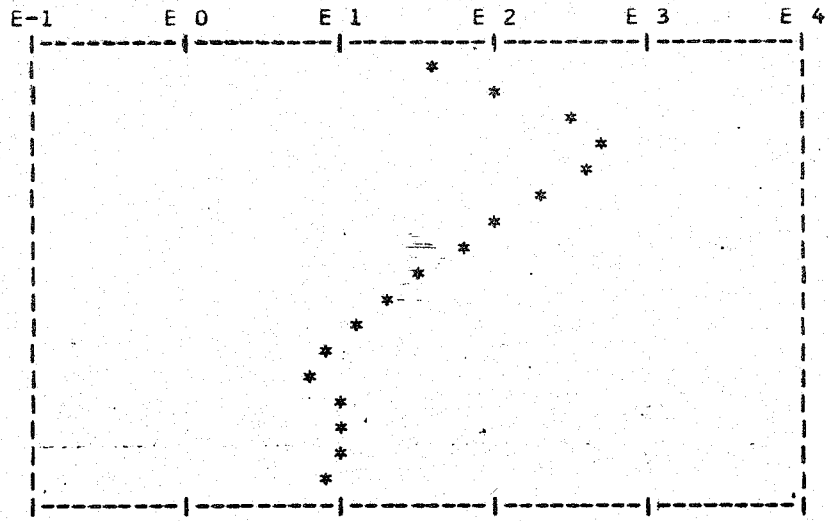
SERIES 1 C

I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.1597E 04	0.1597E 04	9.16	9.16
1	32.00	0.03	0.2433E 04	0.4030E 04	13.96	23.12
2	16.00	0.06	0.4469E 04	0.8499E 04	25.64	48.76
3	10.67	0.09	0.4706E 04	0.1321E 05	27.00	75.76
4	8.00	0.13	0.2535E 04	0.1574E 05	14.54	90.31
5	6.40	0.16	0.9488E 03	0.1669E 05	5.44	95.75
6	5.33	0.19	0.3564E 03	0.1705E 05	2.05	97.80
7	4.57	0.22	0.1615E 03	0.1721E 05	0.93	98.72
8	4.00	0.25	0.7926E 02	0.1729E 05	0.45	99.18
9	3.56	0.28	0.4685E 02	0.1733E 05	0.27	99.45
10	3.20	0.31	0.3251E 02	0.1737E 05	0.19	99.63
11	2.91	0.34	0.1893E 02	0.1736E 05	0.11	99.74
12	2.67	0.38	0.1113E 02	0.1740E 05	0.06	99.80
13	2.46	0.41	0.1096E 02	0.1741E 05	0.06	99.87
14	2.29	0.44	0.1062E 02	0.1742E 05	0.06	99.93
15	2.13	0.47	0.7310E 01	0.1742E 05	0.04	99.97
16	2.00	0.50	0.5285E 01	0.1743E 05	0.03	100.00



SERIES 2 I

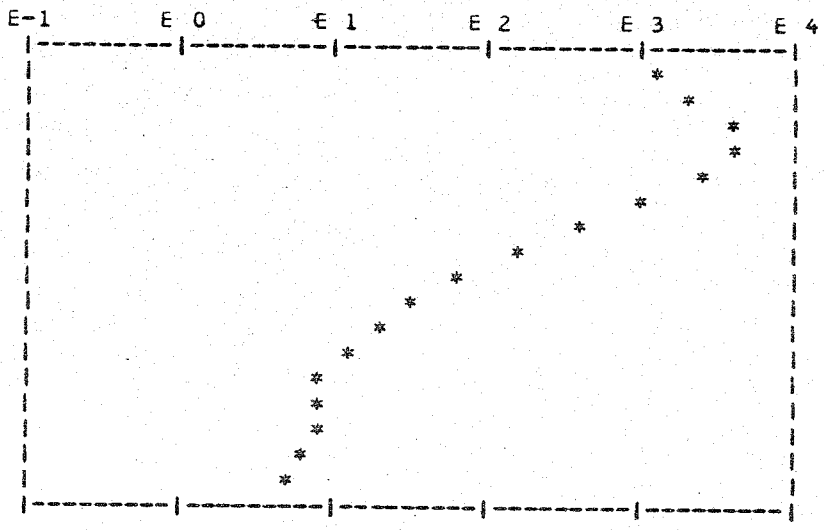
I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.3547E 02	0.3547E 02	2.16	2.16
1	32.00	0.03	0.8545E 02	0.1209E 03	5.21	7.37
2	16.00	0.06	0.2980E 03	0.4189E 03	18.17	25.55
3	10.67	0.09	0.4719E 03	0.8908E 03	28.78	54.33
4	8.00	0.13	0.3363E 03	0.1227E 04	20.51	74.84
5	6.40	0.16	0.1673E 03	0.1394E 04	10.20	85.04
6	5.33	0.19	0.9076E 02	0.1485E 04	5.54	90.58
7	4.57	0.22	0.5296E 02	0.1538E 04	3.23	93.81
8	4.00	0.25	0.2762E 02	0.1566E 04	1.68	95.49
9	3.56	0.28	0.1614E 02	0.1582E 04	0.98	96.48
10	3.20	0.31	0.1143E 02	0.1593E 04	0.70	97.18
11	2.91	0.34	0.7329E 01	0.1601E 04	0.45	97.62
12	2.67	0.38	0.6116E 01	0.1607E 04	0.37	98.00
13	2.46	0.41	0.8473E 01	0.1615E 04	0.52	98.51
14	2.29	0.44	0.9909E 01	0.1625E 04	0.60	99.12
15	2.13	0.47	0.8048E 01	0.1633E 04	0.49	99.61
16	2.00	0.50	0.6436E 01	0.1640E 04	0.39	100.00



AUTO SPECTRA OF ENDOG. VAR. GEN. BY EXOG. VAR. & RES.

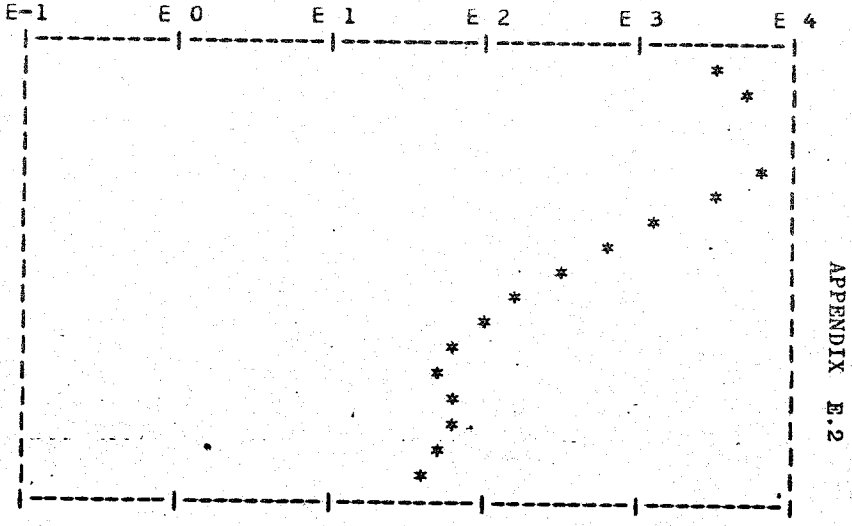
SERIES 3 W1

I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.1166E 04	0.1166E 04	8.31	8.31
1	32.00	0.03	0.1804E 04	0.2970E 04	12.85	21.16
2	16.00	0.06	0.3491E 04	0.6461E 04	24.87	46.03
3	10.67	0.09	0.3902E 04	0.1036E 05	27.80	73.83
4	8.00	0.13	0.2211E 04	0.1257E 05	15.75	89.58
5	6.40	0.16	0.8531E 03	0.1343E 05	6.08	95.66
6	5.33	0.19	0.3205E 03	0.1375E 05	2.28	97.94
7	4.57	0.22	0.1388E 03	0.1389E 05	0.99	98.93
8	4.00	0.25	0.6113E 02	0.1395E 05	0.44	99.36
9	3.56	0.28	0.3012E 02	0.1398E 05	0.21	99.58
10	3.20	0.31	0.1757E 02	0.1400E 05	0.13	99.71
11	2.91	0.34	0.1030E 02	0.1401E 05	0.07	99.78
12	2.67	0.38	0.7017E 01	0.1401E 05	0.05	99.83
13	2.46	0.41	0.7259E 01	0.1402E 05	0.05	99.88
14	2.29	0.44	0.7204E 01	0.1403E 05	0.05	99.93
15	2.13	0.47	0.5401E 01	0.1403E 05	0.04	99.97
16	2.00	0.50	0.4157E 01	0.1404E 05	0.03	100.00



SERIES 4 Y

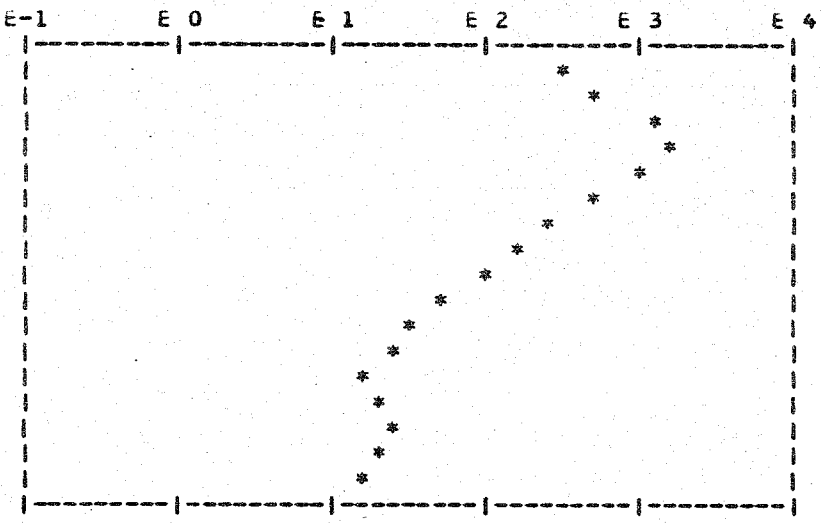
I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.2796E 04	0.2796E 04	7.51	7.51
1	32.00	0.03	0.4452E 04	0.7248E 04	11.95	19.46
2	16.00	0.06	0.8803E 04	0.1605E 05	23.64	43.10
3	10.67	0.09	0.1011E 05	0.2616E 05	27.16	70.25
4	8.00	0.13	0.6048E 04	0.3221E 05	16.24	86.49
5	6.40	0.16	0.2552E 04	0.3476E 05	6.85	93.34
6	5.33	0.19	0.1101E 04	0.3587E 05	2.96	96.30
7	4.57	0.22	0.5648E 03	0.3643E 05	1.52	97.82
8	4.00	0.25	0.2821E 03	0.3671E 05	0.76	98.57
9	3.56	0.28	0.1471E 03	0.3686E 05	0.39	98.97
10	3.20	0.31	0.9652E 02	0.3696E 05	0.26	99.23
11	2.91	0.34	0.6150E 02	0.3702E 05	0.17	99.39
12	2.67	0.38	0.4435E 02	0.3706E 05	0.12	99.51
13	2.46	0.41	0.5042E 02	0.3711E 05	0.14	99.65
14	2.29	0.44	0.5431E 02	0.3717E 05	0.15	99.79
15	2.13	0.47	0.4295E 02	0.3721E 05	0.12	99.91
16	2.00	0.50	0.3426E 02	0.3724E 05	0.09	100.00



AUTO SPECTRA OF ENDOG. VAR. GEN. BY EXOG. VAR. & RES.

SERIES 5 P

I	T(I)	L(I)	POWER	SUM POWER	%	SUM %
0	999.99	0.0	0.3049E 03	0.3049E 03	6.02	6.02
1	32.00	0.03	0.4946E 03	0.7995E 03	9.76	15.78
2	16.00	0.06	0.1024E 04	0.1823E 04	20.21	35.99
3	10.67	0.09	0.1285E 04	0.3108E 04	25.37	61.36
4	8.00	0.13	0.8672E 03	0.3976E 04	17.12	78.48
5	6.40	0.16	0.4326E 03	0.4408E 04	8.54	87.02
6	5.33	0.19	0.2393E 03	0.4647E 04	4.72	91.75
7	4.57	0.22	0.1527E 03	0.4800E 04	3.02	94.76
8	4.00	0.25	0.8360E 02	0.4884E 04	1.65	96.41
9	3.56	0.28	0.4421E 02	0.4928E 04	0.87	97.28
10	3.20	0.31	0.3074E 02	0.4959E 04	0.61	97.89
11	2.91	0.34	0.2099E 02	0.4980E 04	0.41	98.31
12	2.67	0.38	0.1582E 02	0.4996E 04	0.31	98.62
13	2.46	0.41	0.1885E 02	0.5014E 04	0.37	98.99
14	2.29	0.44	0.2087E 02	0.5035E 04	0.41	99.40
15	2.13	0.47	0.1676E 02	0.5052E 04	0.33	99.73
16	2.00	0.50	0.1356E 02	0.5066E 04	0.27	100.00



CROSS SPECTRA OF ENDOG. VAR. GEN. BY EXOG. VAR. & RES.

SERIES 1 C AND SERIES 2 I

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
			0.0 1.0	-.5 0.0 +.5	0.0 1.0 2.0
0	999.99	0.0	0.019	0.0	0.919
1	32.00	0.03	0.541	-0.333	3.924
2	16.00	0.06	0.865	-0.282	3.602
3	10.67	0.09	0.928	-0.247	3.043
4	8.00	0.13	0.928	-0.224	2.645
5	6.40	0.16	0.904	-0.208	2.264
6	5.33	0.19	0.878	-0.187	1.857
7	4.57	0.22	0.873	-0.157	1.631
8	4.00	0.25	0.873	-0.136	1.583
9	3.56	0.28	0.877	-0.139	1.596
10	3.20	0.31	0.882	-0.139	1.583
11	2.91	0.34	0.872	-0.132	1.501
12	2.67	0.38	0.882	-0.117	1.267
13	2.46	0.41	0.916	-0.099	1.089
14	2.29	0.44	0.902	-0.077	0.984
15	2.13	0.47	0.857	-0.045	0.882
16	2.00	0.50	0.814	-0.000	0.818

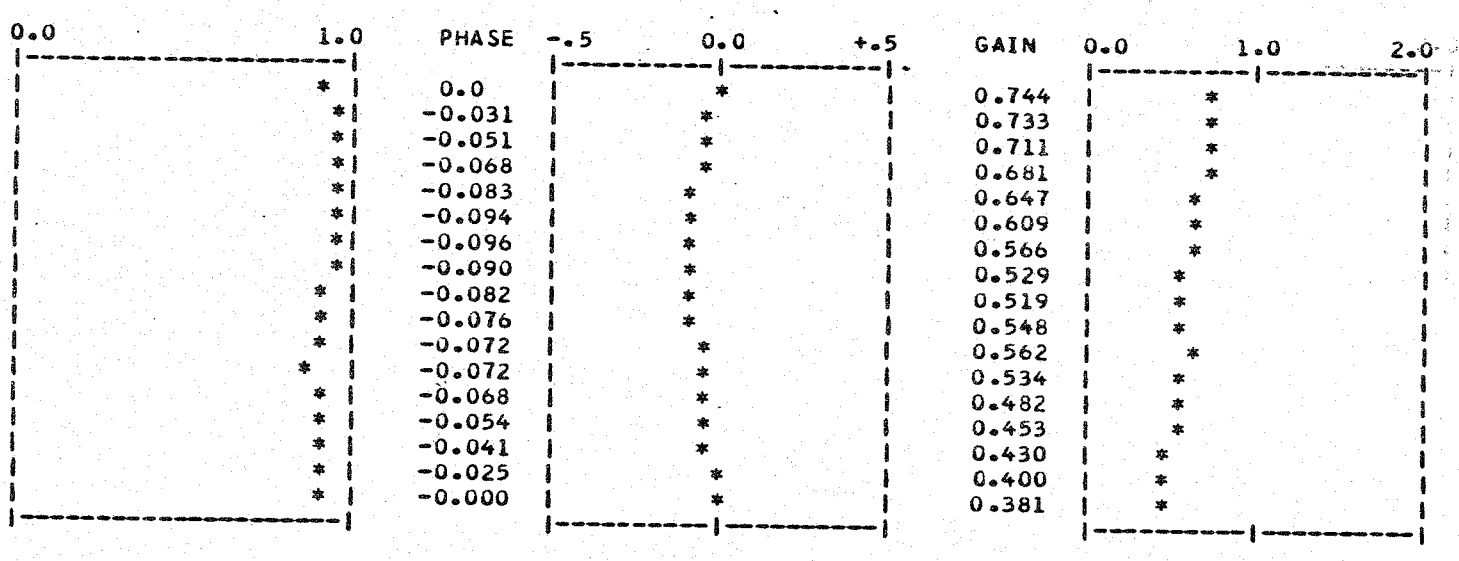
SERIES 1 C AND SERIES 3 W1

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
			0.0 1.0	-.5 0.0 +.5	0.0 1.0 2.0
0	999.99	0.0	0.977	0.0	1.156
1	32.00	0.03	0.986	-0.010	1.153
2	16.00	0.06	0.995	-0.013	1.129
3	10.67	0.09	0.998	-0.012	1.097
4	8.00	0.13	0.998	-0.011	1.070
5	6.40	0.16	0.996	-0.007	1.052
6	5.33	0.19	0.989	0.004	1.049
7	4.57	0.22	0.975	0.017	1.065
8	4.00	0.25	0.960	0.025	1.115
9	3.56	0.28	0.946	0.020	1.213
10	3.20	0.31	0.918	0.007	1.288
11	2.91	0.34	0.868	-0.001	1.263
12	2.67	0.38	0.871	0.013	1.176
13	2.46	0.41	0.927	0.010	1.183
14	2.29	0.44	0.925	-0.007	1.168
15	2.13	0.47	0.880	-0.014	1.091
16	2.00	0.50	0.829	0.000	1.026

CROSS SPECTRA OF ENDOG. VAR. GEN. BY EXOG. VAR. & RES.

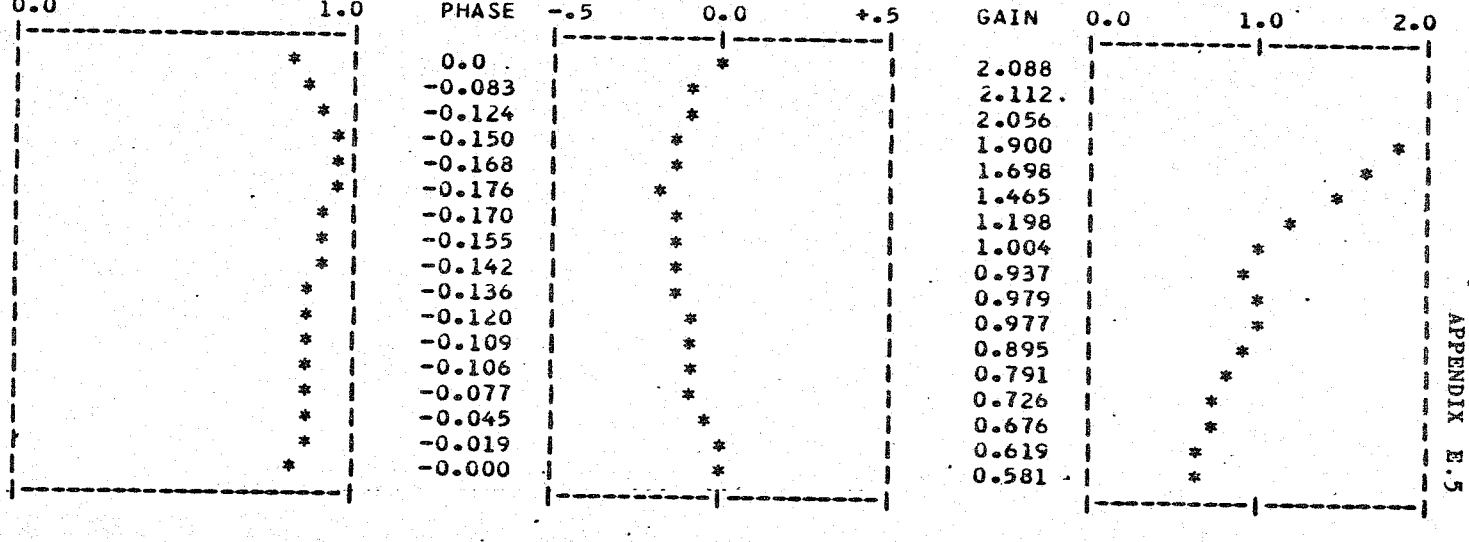
SERIES 1 C AND SERIES 4 Y

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.969	0.0	0.744
1	32.00	0.03	0.983	-0.031	0.733
2	16.00	0.06	0.995	-0.051	0.711
3	10.67	0.09	0.998	-0.068	0.681
4	8.00	0.13	0.998	-0.083	0.647
5	6.40	0.16	0.996	-0.094	0.609
6	5.33	0.19	0.991	-0.096	0.566
7	4.57	0.22	0.980	-0.090	0.529
8	4.00	0.25	0.960	-0.082	0.519
9	3.56	0.28	0.945	-0.076	0.548
10	3.20	0.31	0.940	-0.072	0.562
11	2.91	0.34	0.925	-0.072	0.534
12	2.67	0.38	0.927	-0.068	0.482
13	2.46	0.41	0.945	-0.054	0.453
14	2.29	0.44	0.946	-0.041	0.430
15	2.13	0.47	0.942	-0.025	0.400
16	2.00	0.50	0.941	-0.000	0.381



SERIES 1 C AND SERIES 5 P

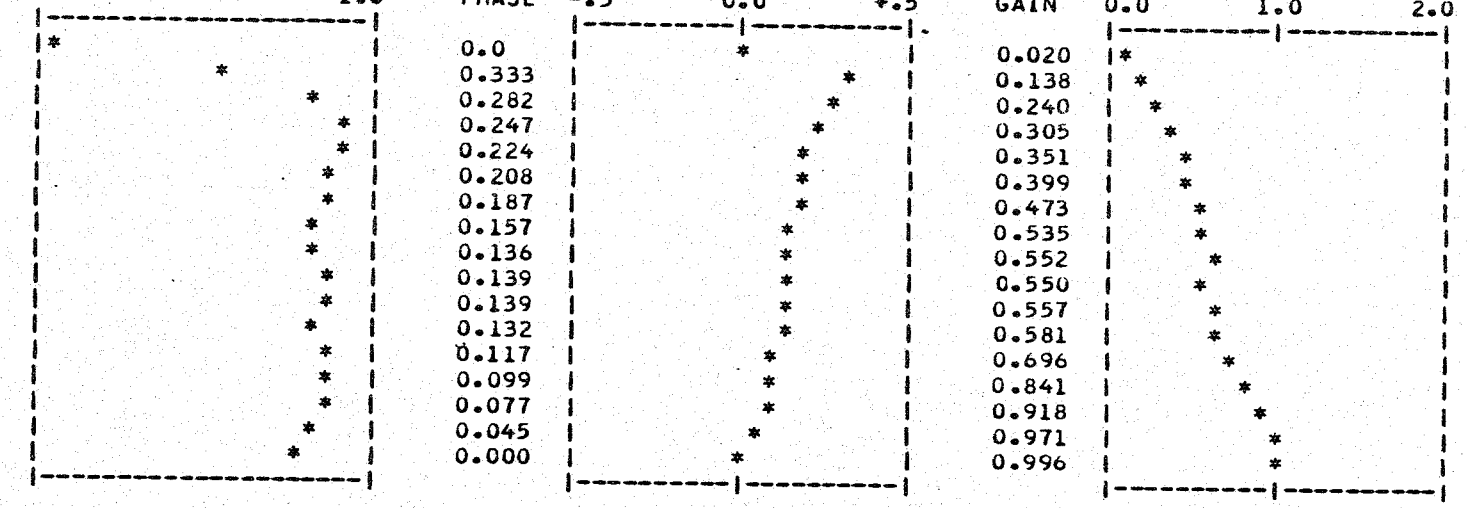
I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.833	0.0	2.088
1	32.00	0.03	0.907	-0.083	2.112
2	16.00	0.06	0.968	-0.124	2.056
3	10.67	0.09	0.985	-0.150	1.900
4	8.00	0.13	0.987	-0.168	1.698
5	6.40	0.16	0.979	-0.176	1.465
6	5.33	0.19	0.964	-0.170	1.198
7	4.57	0.22	0.953	-0.155	1.004
8	4.00	0.25	0.927	-0.142	0.937
9	3.56	0.28	0.905	-0.136	0.979
10	3.20	0.31	0.903	-0.120	0.977
11	2.91	0.34	0.887	-0.109	0.895
12	2.67	0.38	0.889	-0.106	0.791
13	2.46	0.41	0.906	-0.077	0.726
14	2.29	0.44	0.898	-0.045	0.676
15	2.13	0.47	0.879	-0.019	0.619
16	2.00	0.50	0.866	-0.000	0.581



CROSS SPECTRA OF ENDOG. VAR. GEN. BY EXOG. VAR. & RES.

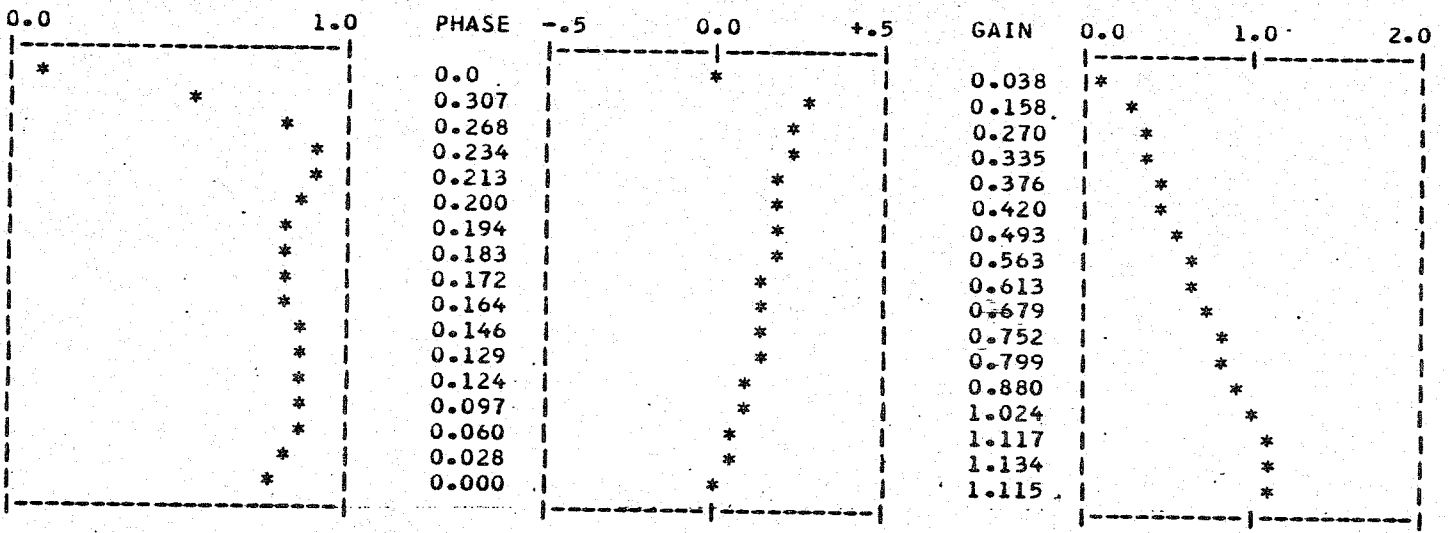
SERIES 2 I AND SERIES 1 C

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.019	0.0	0.020
1	32.00	0.03	0.541	0.333	0.138
2	16.00	0.06	0.865	0.282	0.240
3	10.67	0.09	0.928	0.247	0.305
4	8.00	0.13	0.928	0.224	0.351
5	6.40	0.16	0.904	0.208	0.399
6	5.33	0.19	0.878	0.187	0.473
7	4.57	0.22	0.873	0.157	0.535
8	4.00	0.25	0.873	0.136	0.552
9	3.56	0.28	0.877	0.139	0.550
10	3.20	0.31	0.882	0.139	0.557
11	2.91	0.34	0.872	0.132	0.581
12	2.67	0.38	0.882	0.117	0.696
13	2.46	0.41	0.916	0.099	0.841
14	2.29	0.44	0.902	0.077	0.918
15	2.13	0.47	0.857	0.045	0.971
16	2.00	0.50	0.814	0.000	0.996



SERIES 2 I AND SERIES 3 W1

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.048	0.0	0.038
1	32.00	0.03	0.528	0.307	0.158
2	16.00	0.06	0.856	0.268	0.270
3	10.67	0.09	0.926	0.234	0.335
4	8.00	0.13	0.929	0.213	0.376
5	6.40	0.16	0.900	0.200	0.420
6	5.33	0.19	0.857	0.194	0.493
7	4.57	0.22	0.832	0.183	0.563
8	4.00	0.25	0.831	0.172	0.613
9	3.56	0.28	0.860	0.164	0.679
10	3.20	0.31	0.888	0.146	0.752
11	2.91	0.34	0.897	0.129	0.799
12	2.67	0.38	0.888	0.124	0.880
13	2.46	0.41	0.899	0.097	1.024
14	2.29	0.44	0.907	0.060	1.117
15	2.13	0.47	0.863	0.028	1.134
16	2.00	0.50	0.803	0.000	1.115



CROSS SPECTRA OF ENDOG. VAR. GEN. BY EXOG. VAR. & RES.

SERIES 2 I AND SERIES 4 Y

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.047	0.0	0.024
1	32.00	0.03	0.573	0.292	0.105
2	16.00	0.06	0.875	0.231	0.172
3	10.67	0.09	0.935	0.180	0.209
4	8.00	0.13	0.938	0.142	0.228
5	6.40	0.16	0.916	0.114	0.245
6	5.33	0.19	0.884	0.094	0.270
7	4.57	0.22	0.872	0.074	0.286
8	4.00	0.25	0.878	0.062	0.293
9	3.56	0.28	0.892	0.065	0.313
10	3.20	0.31	0.899	0.065	0.326
11	2.91	0.34	0.887	0.053	0.325
12	2.67	0.38	0.878	0.043	0.348
13	2.46	0.41	0.882	0.039	0.385
14	2.29	0.44	0.867	0.029	0.398
15	2.13	0.47	0.841	0.014	0.397
16	2.00	0.50	0.824	0.000	0.393

COHERENCE 0.0 — 1.0 | PHASE -.5 — 0.0 — +.5 | GAIN 0.0 — 1.0 — 2.0

SERIES 2 I AND SERIES 5 P

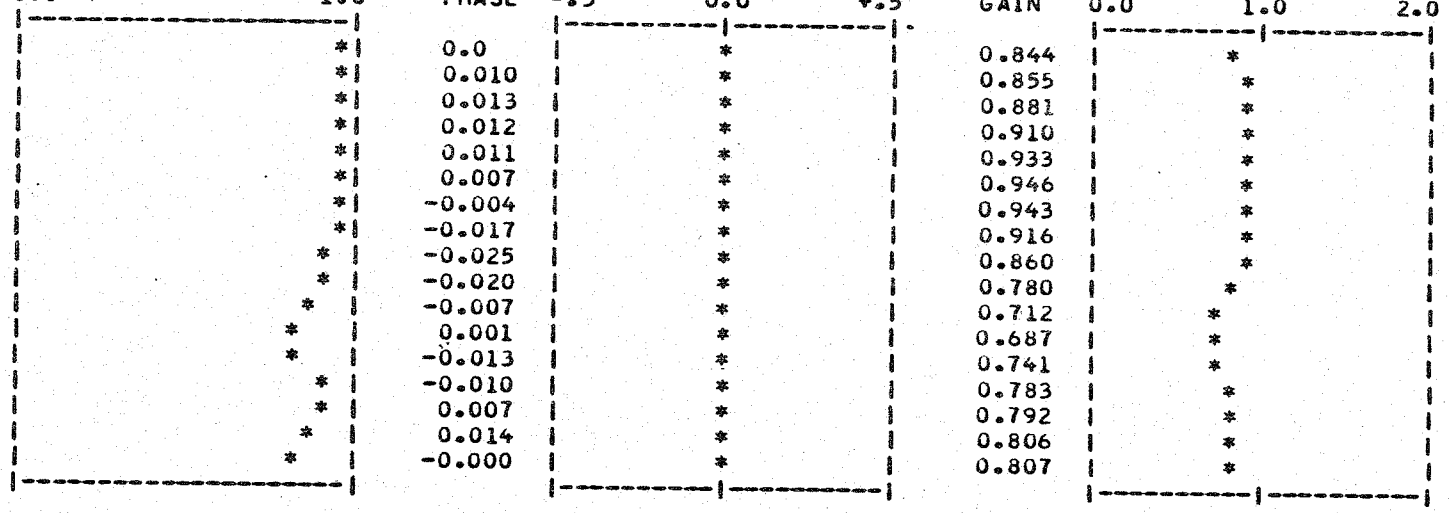
I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.050	0.0	0.077
1	32.00	0.03	0.644	0.249	0.333
2	16.00	0.06	0.906	0.161	0.514
3	10.67	0.09	0.951	0.098	0.591
4	8.00	0.13	0.955	0.057	0.608
5	6.40	0.16	0.940	0.032	0.603
6	5.33	0.19	0.918	0.017	0.590
7	4.57	0.22	0.909	0.003	0.562
8	4.00	0.25	0.911	-0.004	0.549
9	3.56	0.28	0.906	0.003	0.575
10	3.20	0.31	0.875	0.015	0.571
11	2.91	0.34	0.823	0.012	0.536
12	2.67	0.38	0.827	0.003	0.566
13	2.46	0.41	0.854	0.018	0.620
14	2.29	0.44	0.827	0.024	0.627
15	2.13	0.47	0.789	0.015	0.615
16	2.00	0.50	0.770	-0.000	0.604

COHERENCE 0.0 — 1.0 | PHASE -.5 — 0.0 — +.5 | GAIN 0.0 — 1.0 — 2.0

CROSS SPECTRA OF ENDOG. VAR. GEN. BY EXOG. VAR. & RES.

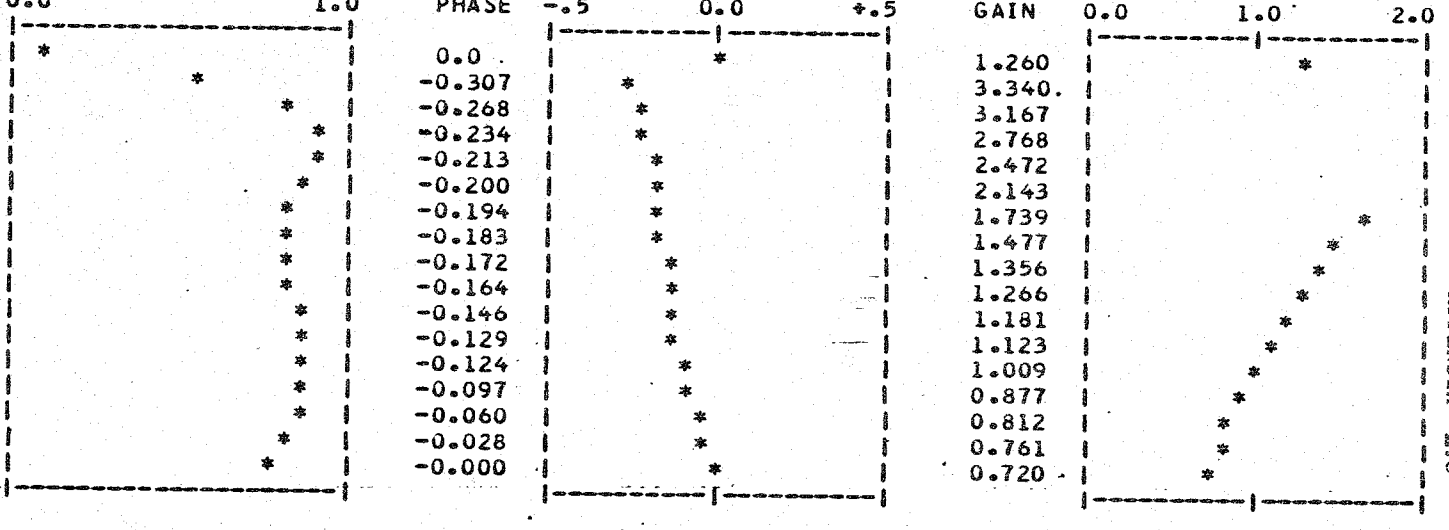
SERIES 3 W1 AND SERIES 1 C

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.977	0.0	0.844
1	32.00	0.03	0.986	0.010	0.855
2	16.00	0.06	0.995	0.013	0.881
3	10.67	0.09	0.998	0.012	0.910
4	8.00	0.13	0.998	0.011	0.933
5	6.40	0.16	0.996	0.007	0.946
6	5.33	0.19	0.989	-0.004	0.943
7	4.57	0.22	0.975	-0.017	0.916
8	4.00	0.25	0.960	-0.025	0.860
9	3.56	0.28	0.946	-0.020	0.780
10	3.20	0.31	0.918	-0.007	0.712
11	2.91	0.34	0.868	0.001	0.687
12	2.67	0.38	0.871	-0.013	0.741
13	2.46	0.41	0.927	-0.010	0.783
14	2.29	0.44	0.925	0.007	0.792
15	2.13	0.47	0.880	0.014	0.806
16	2.00	0.50	0.829	-0.000	0.807



SERIES 3 W1 AND SERIES 2 I

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.048	0.0	1.260
1	32.00	0.03	0.528	-0.307	3.340.
2	16.00	0.06	0.856	-0.268	3.167
3	10.67	0.09	0.926	-0.234	2.768
4	8.00	0.13	0.929	-0.213	2.472
5	6.40	0.16	0.900	-0.200	2.143
6	5.33	0.19	0.857	-0.194	1.739
7	4.57	0.22	0.832	-0.183	1.477
8	4.00	0.25	0.831	-0.172	1.356
9	3.56	0.28	0.860	-0.164	1.266
10	3.20	0.31	0.888	-0.146	1.181
11	2.91	0.34	0.897	-0.129	1.123
12	2.67	0.38	0.888	-0.124	1.009
13	2.46	0.41	0.899	-0.097	0.877
14	2.29	0.44	0.907	-0.060	0.812
15	2.13	0.47	0.863	-0.028	0.761
16	2.00	0.50	0.803	-0.000	0.720



CROSS SPECTRA OF ENDOG. VAR. GEN. BY EXOG. VAR. & RES.

SERIES 3 h1 AND SERIES 4 Y

I	T(I)	L(I)	COHERENCE
0	999.99	0.0	0.988
1	32.00	0.03	0.993
2	16.00	0.06	0.997
3	10.67	0.09	0.999
4	8.00	0.13	0.999
5	6.40	0.16	0.997
6	5.33	0.19	0.993
7	4.57	0.22	0.988
8	4.00	0.25	0.981
9	3.56	0.28	0.967
10	3.20	0.31	0.945
11	2.91	0.34	0.918
12	2.67	0.38	0.926
13	2.46	0.41	0.946
14	2.29	0.44	0.934
15	2.13	0.47	0.899
16	2.00	0.50	0.869

COHERENCE 0.0 — 1.0

PHASE
0.0
-0.020
-0.038
-0.055
-0.072
-0.087
-0.101
-0.109
-0.111
-0.103
-0.090
-0.089
-0.094
-0.070
-0.041
-0.021
-0.000

PHASE -.5 — 0.0 — +.5

GAIN
0.642
0.634
0.629
0.621
0.604
0.577
0.538
0.493
0.461
0.445
0.420
0.392
0.383
0.369
0.352
0.336
0.325

GAIN 0.0 — 1.0 — 2.0

SERIES 3 m1 AND SERIES 5 P

I	T(I)	L(I)	COHERENCE
0	999.99	0.0	0.851
1	32.00	0.03	0.909
2	16.00	0.06	0.965
3	10.67	0.09	0.984
4	8.00	0.13	0.987
5	6.40	0.16	0.976
6	5.33	0.19	0.954
7	4.57	0.22	0.940
8	4.00	0.25	0.924
9	3.56	0.28	0.893
10	3.20	0.31	0.843
11	2.91	0.34	0.781
12	2.67	0.38	0.806
13	2.46	0.41	0.871
14	2.29	0.44	0.852
15	2.13	0.47	0.756
16	2.00	0.50	0.673

COHERENCE 0.0 — 1.0

PHASE
0.0
-0.070
-0.110
-0.137
-0.157
-0.170
-0.175
-0.176
-0.174
-0.168
-0.146
-0.138
-0.141
-0.094
-0.046
-0.018
-0.000

PHASE -.5 — 0.0 — +.5

GAIN
1.804
1.821
1.814
1.729
1.586
1.387
1.130
0.924
0.822
0.780
0.702
0.619
0.598
0.579
0.542
0.494
0.454

GAIN 0.0 — 1.0 — 2.0

CROSS SPECTRA OF ENDOG. VAR. GEN. BY EXOG. VAR. & RES.

SERIES 4 Y AND SERIES 1 C

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.969	0.0	1.303
1	32.00	0.03	0.983	0.031	1.341
2	16.00	0.06	0.995	0.051	1.400
3	10.67	0.09	0.998	0.068	1.464
4	8.00	0.13	0.998	0.083	1.543
5	6.40	0.16	0.996	0.094	1.637
6	5.33	0.19	0.991	0.096	1.749
7	4.57	0.22	0.980	0.090	1.851
8	4.00	0.25	0.960	0.082	1.848
9	3.56	0.28	0.945	0.076	1.722
10	3.20	0.31	0.940	0.072	1.670
11	2.91	0.34	0.925	0.072	1.733
12	2.67	0.38	0.927	0.068	1.922
13	2.46	0.41	0.945	0.054	2.084
14	2.29	0.44	0.946	0.041	2.199
15	2.13	0.47	0.942	0.025	2.353
16	2.00	0.50	0.941	0.000	2.470

COHERENCE 0.0 — 1.0 | PHASE -.5 — 0.0 — +.5 | GAIN 0.0 — 1.0 — 2.0

SERIES 4 Y AND SERIES 2 I

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.047	0.0	1.919
1	32.00	0.03	0.573	-0.292	5.466
2	16.00	0.06	0.875	-0.231	5.085
3	10.67	0.09	0.935	-0.180	4.475
4	8.00	0.13	0.938	-0.142	4.107
5	6.40	0.16	0.916	-0.114	3.738
6	5.33	0.19	0.884	-0.094	3.274
7	4.57	0.22	0.872	-0.074	3.050
8	4.00	0.25	0.878	-0.062	2.994
9	3.56	0.28	0.892	-0.065	2.851
10	3.20	0.31	0.899	-0.065	2.756
11	2.91	0.34	0.887	-0.053	2.728
12	2.67	0.38	0.878	-0.043	2.524
13	2.46	0.41	0.882	-0.039	2.291
14	2.29	0.44	0.867	-0.029	2.179
15	2.13	0.47	0.841	-0.014	2.119
16	2.00	0.50	0.824	-0.000	2.095

COHERENCE 0.0 — 1.0 | PHASE -.5 — 0.0 — +.5 | GAIN 0.0 — 1.0 — 2.0

CROSS SPECTRA OF ENDOG. VAR. GEN. BY EXOG. VAR. & RES.

SERIES 4 Y AND SERIES 3 W1

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
			0.0 1.0	-.5 0.0 +.5	0.0 1.0 2.0
0	999.99	0.0	0.988	0.0	1.539
1	32.00	0.03	0.993	0.020	1.566
2	16.00	0.06	0.997	0.038	1.586
3	10.67	0.09	0.999	0.055	1.609
4	8.00	0.13	0.999	0.072	1.653
5	6.40	0.16	0.997	0.087	1.727
6	5.33	0.19	0.993	0.101	1.847
7	4.57	0.22	0.988	0.109	2.005
8	4.00	0.25	0.981	0.111	2.128
9	3.56	0.28	0.967	0.103	2.174
10	3.20	0.31	0.945	0.090	2.253
11	2.91	0.34	0.918	0.089	2.342
12	2.67	0.38	0.926	0.094	2.419
13	2.46	0.41	0.946	0.070	2.563
14	2.29	0.44	0.934	0.041	2.653
15	2.13	0.47	0.899	0.021	2.674
16	2.00	0.50	0.869	0.000	2.677

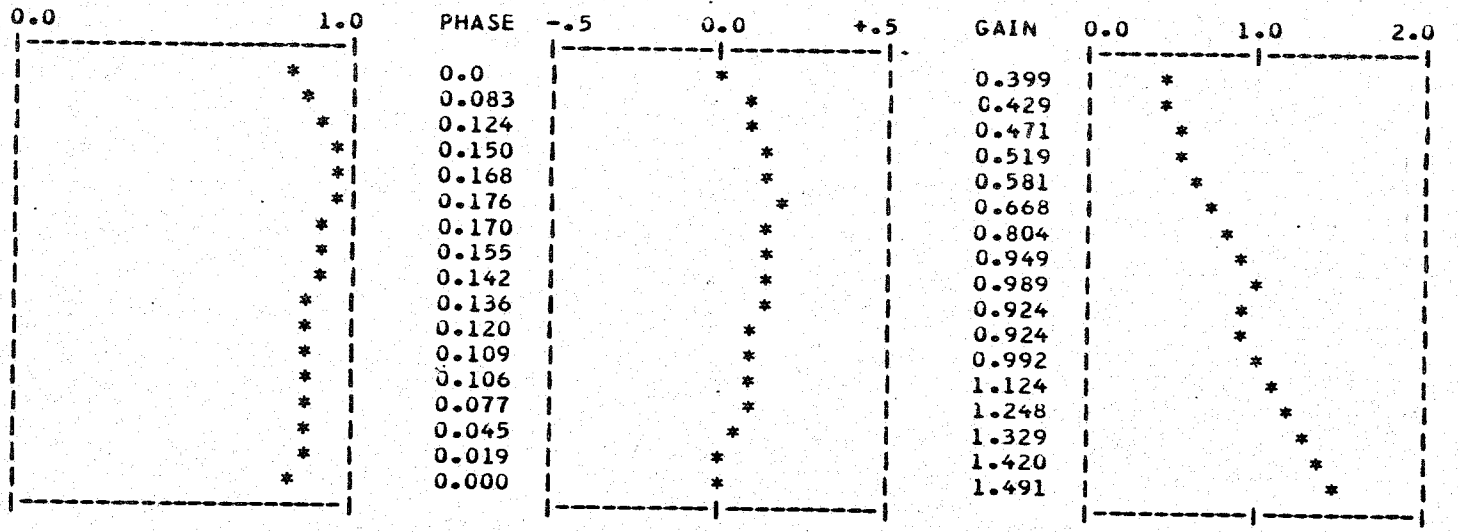
SERIES 4 Y AND SERIES 5 P

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
			0.0 1.0	-.5 0.0 +.5	0.0 1.0 2.0
0	999.99	0.0	0.909	0.0	2.888
1	32.00	0.03	0.945	-0.049	2.916
2	16.00	0.06	0.978	-0.072	2.900
3	10.67	0.09	0.990	-0.082	2.792
4	8.00	0.13	0.992	-0.086	2.631
5	6.40	0.16	0.988	-0.082	2.414
6	5.33	0.19	0.979	-0.075	2.122
7	4.57	0.22	0.976	-0.067	1.900
8	4.00	0.25	0.972	-0.063	1.811
9	3.56	0.28	0.966	-0.064	1.793
10	3.20	0.31	0.961	-0.057	1.737
11	2.91	0.34	0.950	-0.050	1.668
12	2.67	0.38	0.951	-0.045	1.633
13	2.46	0.41	0.966	-0.022	1.607
14	2.29	0.44	0.965	-0.003	1.584
15	2.13	0.47	0.943	0.003	1.555
16	2.00	0.50	0.923	-0.000	1.527

CROSS SPECTRA OF ENDOG. VAR. GEN. BY EXCG. VAR. & RES.

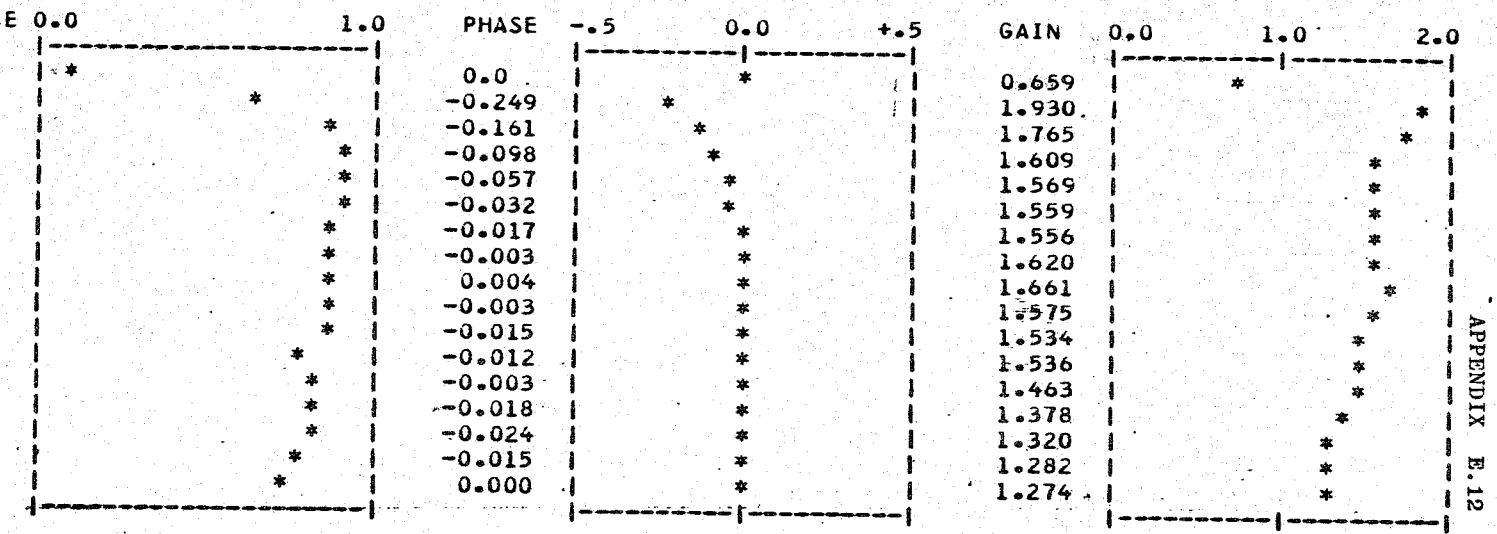
SERIES 5 P AND SERIES 1 C

I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.833	0.0	0.399
1	32.00	0.03	0.907	0.083	0.429
2	16.00	0.06	0.968	0.124	0.471
3	10.67	0.09	0.985	0.150	0.519
4	8.00	0.13	0.987	0.168	0.581
5	6.40	0.16	0.979	0.176	0.668
6	5.33	0.19	0.964	0.170	0.804
7	4.57	0.22	0.953	0.155	0.949
8	4.00	0.25	0.927	0.142	0.989
9	3.56	0.28	0.905	0.136	0.924
10	3.20	0.31	0.903	0.120	0.924
11	2.91	0.34	0.887	0.109	0.992
12	2.67	0.38	0.889	0.106	1.124
13	2.46	0.41	0.906	0.077	1.248
14	2.29	0.44	0.898	0.045	1.329
15	2.13	0.47	0.879	0.019	1.420
16	2.00	0.50	0.866	0.000	1.491



SERIES 5 P AND SERIES 2 I

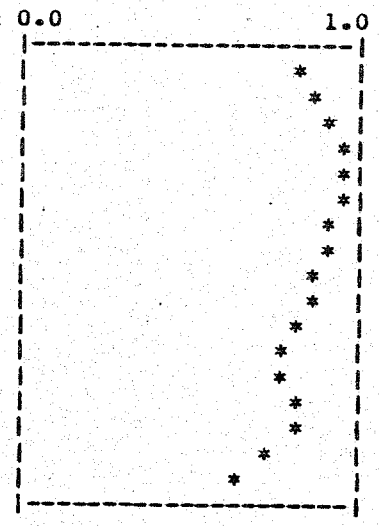
I	T(I)	L(I)	COHERENCE	PHASE	GAIN
0	999.99	0.0	0.050	0.0	0.659
1	32.00	0.03	0.644	-0.249	1.930
2	16.00	0.06	0.906	-0.161	1.765
3	10.67	0.09	0.951	-0.098	1.609
4	8.00	0.13	0.955	-0.057	1.569
5	6.40	0.16	0.940	-0.032	1.559
6	5.33	0.19	0.918	-0.017	1.556
7	4.57	0.22	0.909	-0.003	1.620
8	4.00	0.25	0.911	0.004	1.661
9	3.56	0.28	0.906	-0.003	1.575
10	3.20	0.31	0.875	-0.015	1.534
11	2.91	0.34	0.823	-0.012	1.536
12	2.67	0.38	0.827	-0.003	1.463
13	2.46	0.41	0.854	-0.018	1.378
14	2.29	0.44	0.827	-0.024	1.320
15	2.13	0.47	0.789	-0.015	1.282
16	2.00	0.50	0.770	0.000	1.274



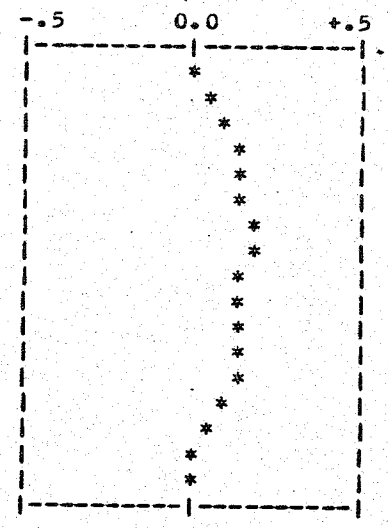
CROSS SPECTRA OF ENDOG. VAR. GEN. BY EXOG. VAR. & RES.

SERIES 5 P AND SERIES 3 W1

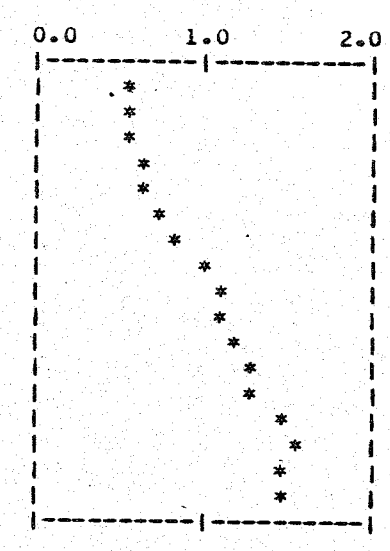
I	T(I)	L(I)	COHERENCE
0	999.99	0.0	0.851
1	32.00	0.03	0.909
2	16.00	0.06	0.965
3	10.67	0.09	0.984
4	8.00	0.13	0.987
5	6.40	0.16	0.976
6	5.33	0.19	0.954
7	4.57	0.22	0.940
8	4.00	0.25	0.924
9	3.56	0.28	0.893
10	3.20	0.31	0.843
11	2.91	0.34	0.781
12	2.67	0.38	0.806
13	2.46	0.41	0.871
14	2.29	0.44	0.852
15	2.13	0.47	0.756
16	2.00	0.50	0.673



PHASE
0.0
0.070
0.110
0.137
0.157
0.170
0.175
0.176
0.174
0.168
0.146
0.138
0.141
0.094
0.046
0.018
0.000

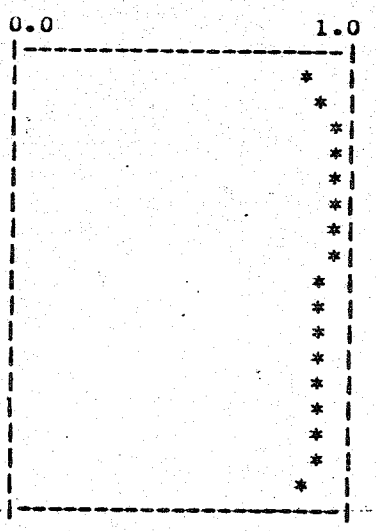


GAIN
0.472
0.499
0.532
0.569
0.622
0.704
0.844
1.017
1.124
1.145
1.200
1.262
1.348
1.504
1.571
1.532
1.481

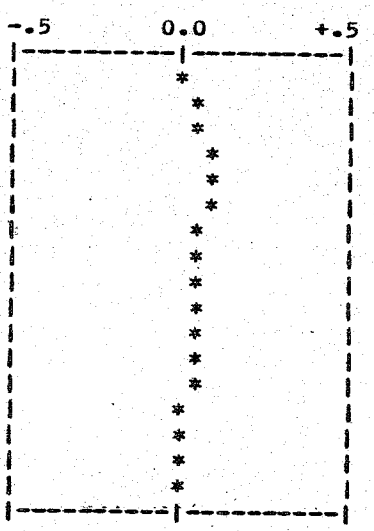


SERIES 5 P AND SERIES 4 Y

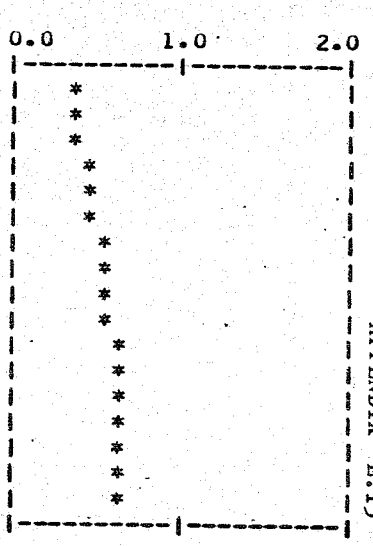
I	T(I)	L(I)	COHERENCE
0	999.99	0.0	0.909
1	32.00	0.03	0.945
2	16.00	0.06	0.978
3	10.67	0.09	0.990
4	8.00	0.13	0.992
5	6.40	0.16	0.988
6	5.33	0.19	0.979
7	4.57	0.22	0.976
8	4.00	0.25	0.972
9	3.56	0.28	0.966
10	3.20	0.31	0.961
11	2.91	0.34	0.950
12	2.67	0.38	0.951
13	2.46	0.41	0.966
14	2.29	0.44	0.965
15	2.13	0.47	0.943
16	2.00	0.50	0.923



PHASE
0.0
0.049
0.072
0.082
0.086
0.082
0.075
0.067
0.063
0.064
0.057
0.050
0.045
0.022
0.003
-0.003
0.000



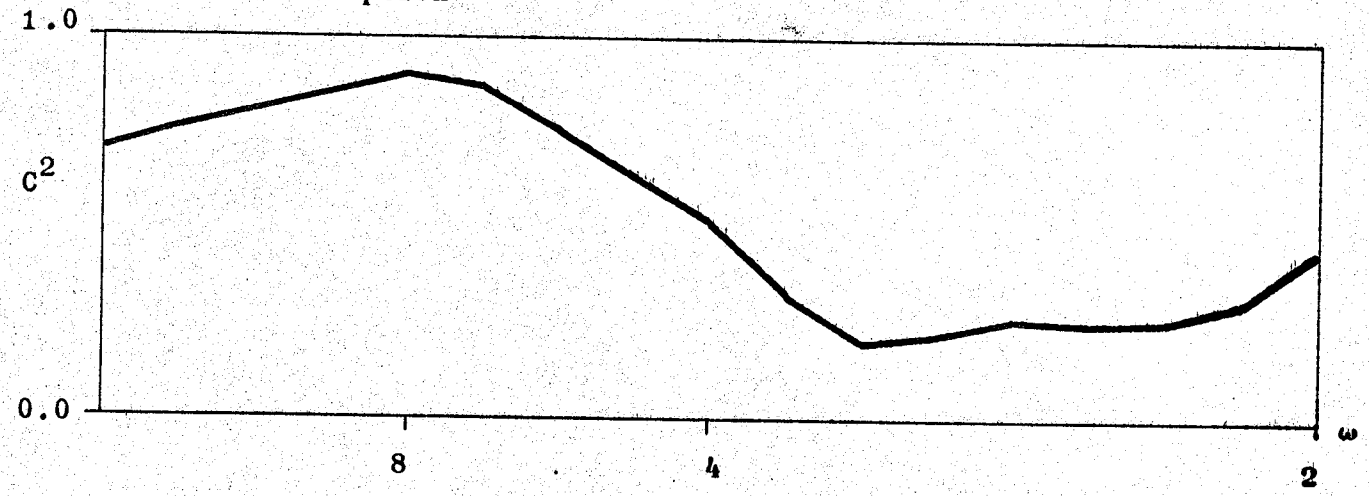
GAIN
0.315
0.324
0.337
0.355
0.377
0.409
0.461
0.514
0.537
0.539
0.553
0.569
0.582
0.601
0.609
0.607
0.604



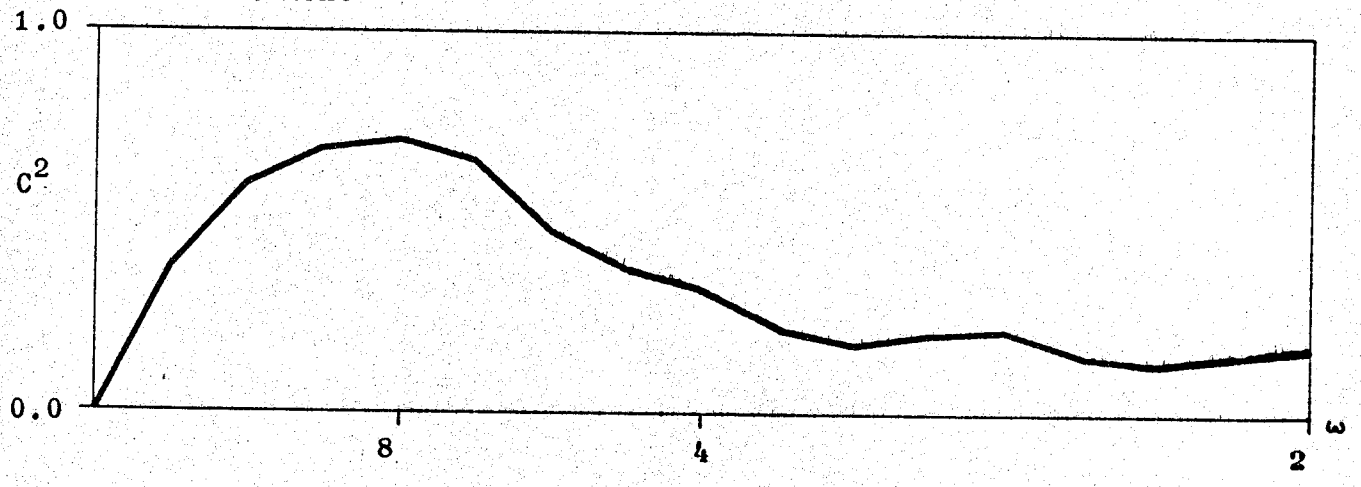
APPENDIX F:

Multiple coherences

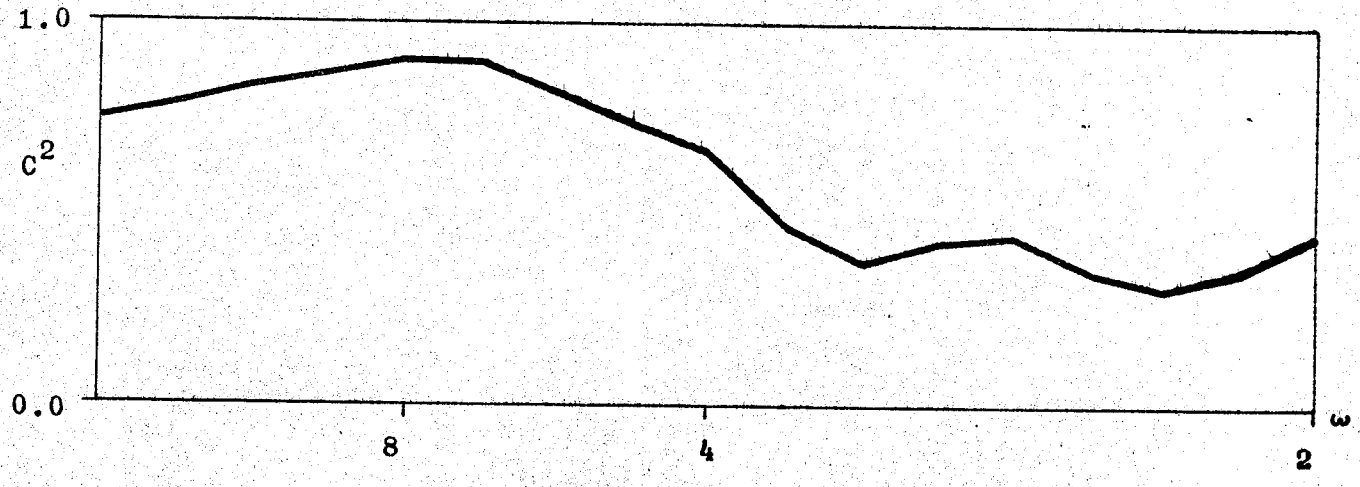
Private Consumption



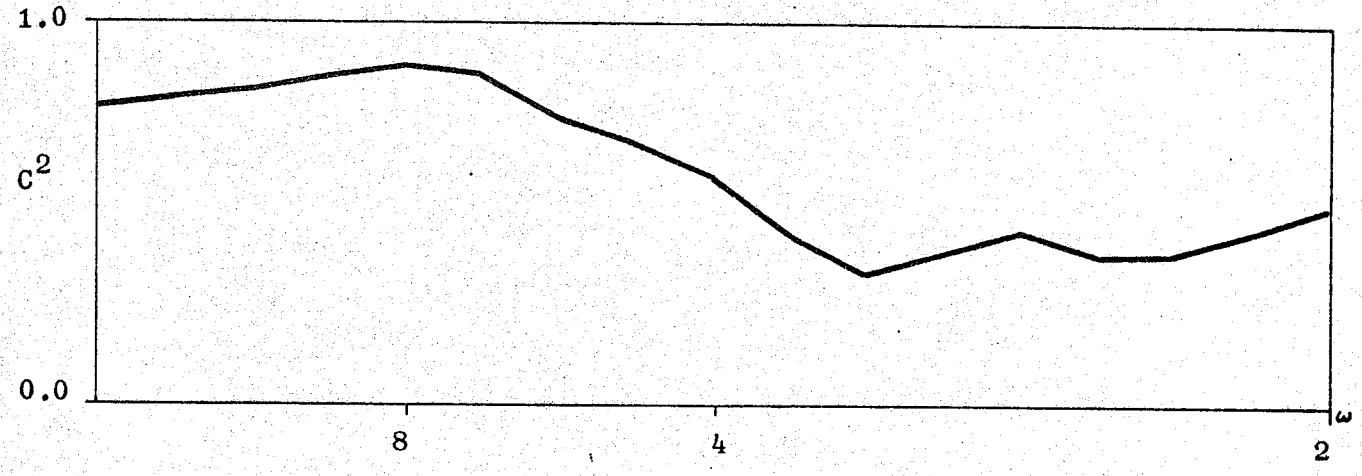
Net Investment



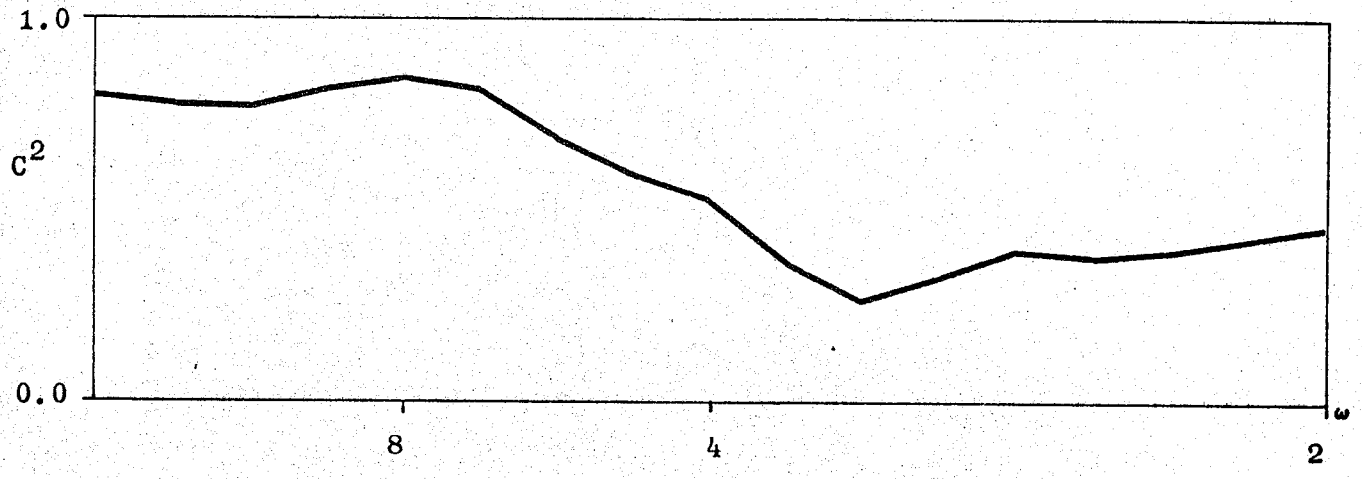
Private Wage Bill



National Income



Profits



CORRIGENDA

Page 4

(4) $$Eu_t u'_s = \begin{cases} \Sigma & \text{for } s=t, \text{ independent of } t, \\ 0 & \text{otherwise.} \end{cases}$$

(6) $$y_t = \left(\sum_{n=0}^{k} B_n L^n\right)^{-1} \left(\sum_{m=0}^{h} \Gamma_m L^m\right) x_t + u_t$$

Page 5

(11) $$\frac{1}{(z-\lambda_i)} = \frac{-\frac{1}{\lambda_i}}{1 - \frac{z}{\lambda_i}}$$

Page 7

(15) $$y_t = \sum_{n=0}^{\infty} C_n a + \sum_{n=0}^{\infty} C_n b\,(t-n) + \ldots.$$

Page 8

(16f) $$c = \sum_{n=0}^{\infty} C_n a + \sum_{n=0}^{\infty} C_n b(-n)$$

(16g) $$d = \sum_{n=0}^{\infty} C_n b$$