

## LETTERS TO THE EDITOR

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ON EQUALLY-CORRELATED  
STATIONARY PROCESSES

A DISCRETE real stationary time series consists of a sequence of real numbers ordered in time, one observation corresponding to each of equally spaced time instants (denoted here by the integral variates  $n$  and  $s$ ), obtained from populations  $\{x(n)\}$  subject to (i)  $E\{x(n)\} = m$ , a constant independent of  $n$  and (ii)  $E\{[x(n+s) - m][x(s) - m]\} = R(n)$ , a function of  $n$  only. An equally correlated process is a particular case, when

$$R(n) = \begin{cases} \rho^2 & \text{for } n = 0 \\ \rho^2 c & \text{for } |n| = 1, 2, \dots, p \text{ ( } |c| \leq 1 \text{ )} \\ 0 & \text{otherwise} \end{cases}$$

That equally correlated stationary processes

exist is easily seen. For such processes, the authors have proved the following:—

**Theorem I.**—The spectrum is absolutely continuous and is given by

$$\frac{1}{2\pi} [1 + c \{e^{i\lambda} + e^{-i\lambda} + e^{2i\lambda} + e^{-2i\lambda} + \dots + e^{pi\lambda} + e^{-pi\lambda}\}]$$

**Theorem II.**—The Hilbert space of the process is linearly non-deterministic, i.e.,  $x(n)$  cannot be fully linearly represented in terms of  $x(n-1), x(n-2), \dots, \text{ad inf.}$

**Theorem III.**—The process cannot be Gaussian.

**Theorem IV.**—If observations are confined to  $(p+1)$  consecutive ones, their arithmetic mean forms the best linear unbiased estimate of  $m$ .

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