LETTERS TO THE EDITOR

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 the 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

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

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

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

Theorem II.—The Hilbert space of the process is linearly non-deterministic, *i.e.*, $x(n)$ cannot be fully linearly represented in terms of $x(n-1)$, $x(n-2)$, ... *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 unbiassed estimate of m.

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