ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

12. Probability and Statistics

1991 MS Classification: 60, 43

Makagon, Andrzej, Hampton University, USA

Periodically Correlated Processes and Mackey's Imprimitivity Theorem.

A second orded stochastic process $X : R \to H$ is called *Periodically Correlated (PC)* if X is continuous and for every s the correlation $K(s+t,t) = (X(t+s), X(t))$ is periodic in t with the same period T (Gladyshev, 1963). Gladyshev proved that a continuous function $K(s,t)$ is the correlation function of a PC process iff the matrix function with entries $K^{k,j}(t) = \exp(-2\pi ikt/T)a_{k-j}(t)$, where $a_j(t) = (1/T)\int_0^T \exp(-2\pi iju/T)K(t+u,u)du$, is positive definite, i. e. iff it is the correlation function of some infinite dimensional stationary process $Y^k(t)$. In this note a method for an explicit reconstruction of the process X from $Y^k(t)$ (and vice versa) is presented. The construction leads to complete characterization of correlation functions of not necessary continuous PC processes. It turns out that this characterization is equivalent to a special case of Mackey's Imprimitivity Theorem.