



**The Hong Kong Polytechnic University
Department of Applied Mathematics**

Colloquium

On

Exponential Stationary Processes and its Implications

by

**Professor Narn-Rueih Shieh
Department of Mathematics
National Taiwan University**

Abstract

Given a strictly stationary process $X=X(t)$, with the exponential moment $Ee^{\theta X(t)} < \infty$, for $\theta \in \Theta$, the normalized exponential process $Y(t) := \frac{e^{\theta X(t)}}{Ee^{\theta X(t)}}$ is also strictly stationary, and is positive-valued, with mean 1. We would like to infer the analysis of the exponential process Y from the underlying X on: (1) The positive correlation of Y , and the correlation decay of $\text{cov}(Y(t+s), Y(t))$ in the time-lag s , and (2) The estimate of the expected maximal increments $E[\max_{0 \leq s \leq r} |Y^q(t+s) - Y^q(t)|]$, for q in a certain range. This will be toward the Multi-fractal Analysis for the infinite product workload process generated from Y , and is related to the burst phenomenon happened in the transactions and the internet traffics. This talk is based on joint works with some co-authors; N. Leonenko (Cardiff, UK), V. Anh (Brisban, AU), and M. Matsui (Nagoya, JP).

Date : 9 April, 2014 (Wednesday)

Time : 11:00 a.m. – 12:00 noon

Venue : TU717, The Hong Kong Polytechnic University

***** ALL ARE WELCOME *****