

# 國立中山大學應用數學系

## 學術演講

講 者：曾聖澧 教授 (中興大學)

講 題：Robust Stationarity Testing and Contiguous Segmentation in Geostatistics

時 間：2024/12/19(Thursday) 14:10~15:00

地 點：理 SC 4009-1 教室

茶 會：13:45

### Abstract

The stationarity assumption is widely used in geostatistics, but its applicability diminishes when dealing with large geographic areas or complicated spatial phenomena. This study introduces an innovative methodology for evaluating the stationarity assumption, focusing on non-stationarity where the spatial covariance varies across the spatial domain. Our approach formulates a statistic that tracks a stable microergodic parameter of the exponential covariance function, allowing us to address the complexities associated with nonstationary processes. We use robust local estimates of spatial covariances, Voronoi tessellations, and iterative clustering of locations for stationarity hypothesis testing. When the stationarity hypothesis is rejected, we present a systematic framework for segmenting the spatial domain into contiguous subregions with more homogeneous and near-stationary properties. We apply the Bayesian information criterion to determine the optimal number of location clusters and implement the fused lasso technique to elucidate nonstationary patterns at different resolutions. The effectiveness of our method is validated through simulation studies and application to a precipitation dataset, demonstrating its potential to improve spatial forecasts and provide insight into underlying spatial processes.

敬 請 公 告！ 歡 迎 參 加！

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