



Contribution ID: 121

Type: **Oral Presentation**

Detection of anomalies in large radiation data streams using changepoint theory

Wednesday 5 March 2025 14:45 (15 minutes)

Detecting the presence of particular radioactive isotopes present for small periods of time in large time series datasets is useful in a number of nuclear security problems. This is a challenging computational task because the number of intervals in a signal quickly becomes large. To tackle it I will combine two mathematical approaches. First, I develop a multivariate likelihood ratio testing framework for this scenario, and show how this provides improvements in statistical power the over use of other approaches such as whole signal detection, photopeak detection, or signal to noise ratio scaling. Second, I will combine this with a changepoint theory approach to recursively test all intervals in the signal without iterating over them. The resulting method is statistically powerful at finding its given targets, and does so using a very low amount of computation even when scanning large signals.

Author: WARD, Kes

Presenter: WARD, Kes

Session Classification: Session 3: Sigma Data and Algorithm Studies