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Type: **Oral**

Analysis to advance common understanding on SAUNA false positives hypothesis

Wednesday, 26 June 2019 16:30 (15 minutes)

The Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) is establishing an International Monitoring System (IMS) including 80 radionuclide stations, of which 40 will also be equipped with capabilities for measuring CTBT relevant xenon isotopes (Xe-131m, Xe-133, Xe-133m and Xe-135). The CTBTO International Data Centre (IDC) operates dedicated analysis software for processing spectral data from the IMS noble gas systems. The analysis of beta-gamma coincidence Noble Gas data is based on Net Count Calculation (NCC) method which, in its standard implementation, only performs interference corrections if a positive net signal is present. A retrospective analysis of reported detections seems to show overestimated rate of false positives for some isotopes. With the aim of improving the analysis results, a new configuration of the NCC method that systematically performs interference corrections was tested and the results are statistically compared with the standard method. Data for the period 2014-2016 from 7 SAUNA systems was used for the analysis of detection rates per detector and per isotope. Achieved results based on the normality test, skewness and kurtosis are visualized through QQ plots and probability density graphs. The presentation will compile the findings based on these statistical Figures Of Merit.

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Session Classification: T3.5 Data Analysis Algorithms, Artificial Intelligence, Big Data and Deep Learning

Track Classification: Theme 3. Verification Technologies and Technique Application