ID: **P3.6-509** Type: **e-Poster**

Analyzing radioxenon spectra with machine learning algorithms to predict Activity Concentration of Each Isotope

Thursday, July 1, 2021 11:45 AM (15 minutes)

In this study, we aim to develop a new approach using machine learning and data mining algorithms to estimate the activity concentration of radioxenon isotopes of any unknown sample without extensive mathematical calculations from calibrated raw spectra. So far, several methods have been applied such as the region-of-interest (ROI) and the simultaneous decomposition analysis tool (SDAT) to estimate net counts for each isotope. By means of machine learning methods, we specifically analyze Beta–Gamma coincidence spectra without the availability of processing parameters that are currently used by the CTBTO such as successive subtractions of background interferences (i.e., radon and its daughters), which can reduce errors and human workload of analysis. Thus, our purpose is to improve MDC in the detection of low-level activity concentration of radioxenon isotopes.

Promotional text

Machine learning for 2D radioxenon beta-gamma coincidence raw radioxenon spectra analysis.

Primary author: Ms AZIMI, Sepideh A. (Amirkabir University of Technology (AUT), Tehran, Iran)

Co-authors: Mr AFARIDEH, Hossein (Amirkabir University of Technology (AUT), Tehran, Iran); Mr KALINOWSKI, Martin B. (CTBTO Preparatory Commission, Vienna, Austria); Mr GHEDDOU, abdelhakim (CTBTO Preparatory Commission, Vienna, Austria)

Presenter: Ms AZIMI, Sepideh A. (Amirkabir University of Technology (AUT), Tehran, Iran)

Session Classification: T3.6 e-poster session

Track Classification: Theme 3. Verification Technologies and Technique Application: T3.6 - Artificial Intelligence and Machine Learning