



Contribution ID: 260 Contribution code: P2.4-260

Type: e-Poster

## Parametric study of the radioxenon data distribution, measured at the noble gas stations of the International Monitoring System of the CTBTO

*Wednesday, 30 June 2021 11:45 (15 minutes)*

The aim of this work is to apply a parametric statistical methodology to the radioxenon activity concentrations measured at noble gas stations of the International Monitoring System of the CTBTO, in order to investigate the radioxenon atmospheric background and the radioxenon anomalous values. The proposed parametric statistical methodology is based on the "Statistical Process Control" method and it consists of using two "Control Charts". The "Single Observation Control" Chart, sensitive to large variation of the measured values, could be useful for periodic monitoring of the phenomenon at the noble gas stations; the "Exponentially Weighted Moving Average" Chart, sensitive to small variations of the measured values, could be used to perform specific studies on the atmospheric background and on the anomalies of radioxenon activity concentrations.

### Promotional text

Radioxenon is useful to potentially reveal underground nuclear explosions (UNEs) but it is also emitted by civil sources. To discriminate signals, advanced statistical methods are used to understand the background and the anomalous values that could be reasonably related to UNEs.

**Primary authors:** Mr OTTAVIANO, Giuseppe (Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), Italy); Mr SCAGLIARINI, Michele (Department of Statistical Sciences, University of Bologna, Italy); Ms RIZZO, Antonietta (Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), Italy); Ms GUERNELLI, Sofia (Department of Statistical Sciences, University of Bologna, Italy); Mr FERRI, Luca (Department of Statistical Sciences, University of Bologna, Italy); Ms SANGUIGNI, Claudia (Department of Statistical Sciences, University of Bologna, Italy); Ms PADOANI, Franca (Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), Italy); Ms CIOCCA, Angelica (Department of Statistical Sciences, University of Bologna, Italy)

**Presenter:** Mr OTTAVIANO, Giuseppe (Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), Italy)

**Session Classification:** T2.4 e-poster session

**Track Classification:** Theme 2. Events and Nuclear Test Sites: T2.4 - Atmospheric and Subsurface Radionuclide Background and Dispersion