

Time Series Reconstruction as a Preventive Maintenance Tool for the Radionuclide IMS Data

The Article IV section B the CTBT defines the IMS, which is responsible for verifying compliance with the Treaty. Data generated by the IMS and processed by the IDC are often fragmented because some data is below the detection limit. This implies that they need to be reconstructed using autoregressive models for more advanced statistical analysis. The use of advanced statistic allows monitoring the evolution of activity concentration in a more accurate way before, during and after a radiological event. In addition, the statistical characterization of the time series serves as an indication of a possible malfunction in the measuring station, which allows to anticipate the preventive actions without losing quality in the operation of the network and decrease maintenance costs. This methodology has been carried out for the ^{133}Xe radionuclide registered at the RN38 station (Takasaki, Japan) from the 1st of August to the 31st of October, 2016. Preliminary results on the time evolution of the signal positive allowed to establish the baseline for ^{133}Xe , to detect the significant high concentration events and to obtain time trends that could be related to the data quality and equipment output.

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