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Generation of Synthetic Radionuclide Spectra to Support the NDC Preparedness Exercise NPE15

As part of the 2015 NDC Preparedness Exercise (NPE15), the production of a large number of synthetic spectra was required both for Noble Gas and particulates technologies. The NPE15 control team requested the CTBTO to generate the largest portion of the particulate spectra with specified nuclides of interest and activity concentrations. Some spectra contain a very large number of radionuclides (up to 80) and with very high activities. This presentation describes the key methodological aspects and tools used by the CTBTO to meet these high requirements: (a) optimization of the Monte Carlo model of VGSL (Virtual Gamma Spectroscopy Laboratory) tool with detailed simulation parameters (specific IMS detector, shielding and source geometry), (b) simulation of spectra matching the high activities of the CTBT relevant nuclides as provided by the control team and (c) combination with actual sample spectra as sent by IMS stations, which represents the station background conditions (d) creation of SPHD files in IMS 2.0 format (e) test of samples with NDC-in-a-box automatic processing and interactive analysis software. The result is a set of 21 spectra that were used by the participants of the NPE15 and that can in future be used for training and testing purposes.

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