Geophysical Research Abstracts, Vol. 11, EGU2009-12580-1, 2009 EGU General Assembly 2009 © Author(s) 2009



## Application of the standard spectrum method for radioxenon spectrum analysis

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Monitoring specific xenon isotopes in atmospheric air samples is a key element of the Comprehensive Nuclear Test-Ban Treaty (CTBT) verification system. Systems specially developed for the specific treaty verification tasks collect, purify and concentrate air samples and analyze them with either high purity Germanium detectors or special beta-gamma coincidence detectors. The purification process in combination with relatively stable operation conditions of the detectors at one station over long periods render series of spectra, which can be approximated by a few principal components. The components belonging to the four isotopes of interest, namely Xe-133, Xe-131m, Xe-133m and Xe-135 provide an estimator for their activity concentration. Other spectrum components are the detector background and radon impurities. Different options for generating the standard spectra are discussed and compared. Spectrum analysis results are scrutinized for statistical quality of the isotope activity estimator and compared with other software which is using peak fitting routines. A reduction of the variance of calculated peak activities renders lower critical limits for isotope detection and, through this, enhances the sensitivity and performance of the CTBT noble gas monitoring network.