ID: Type: **Poster**

Detection of Elevated Xe-135 in Northern Japan

The Pacific Northwest National Laboratory (PNNL), the Comprehensive Test-Ban-Treaty Organization (CTBTO) and willing local partners have made a series of measurements in a number of regions to better understand radioactive xenon measurements in hopes of improving discrimination of background sources and potential nuclear explosions. A measurement campaign was conducted in Northern Japan with cooperation from the Japan Atomic Energy Agency (JAEA) from April through September 2012, in an area where backgrounds were poorly understood. A most unusual signature was measured during this time period, a time when all local reactors were shut down. Measurements showed a single sample with a nearly pure xenon-135 isotopic signal, which has never occurred in an environmental sample to our knowledge. We present possible sources of pure xenon-135 in environmental samples and discuss how such events affect a xenon categorization scheme.

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Track Classification: Theme 1: The Earth as a Complex System