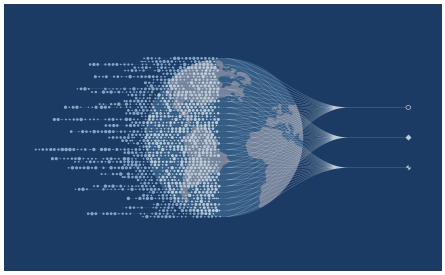

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# of Chemical Explosive Experiments with Subsurface Noble Gas Transport and Atmospheric Releases

Understanding the propagation of the waveform and radionuclide signals is an important component of the International Monitoring System. On October 18th, 2023 we executed a 16.3 T chemical explosive experiment with stable radioxenon and tritium tracers to understand pressure-driven transport through the subsurface. The initial chemical explosion and subsequent gas migration were monitored with a network of seismic, infrasound, EM, radionuclide, and stable gas sensors. The waveform sensors provided characterization of the seismic, acoustic, and EM signals at varying distances immediately following the chemical explosion. The material sensors included real-time radioxenon, tritium, and high explosive by-product sensors, as well as a series of samples that collected gas and water for laboratory measurement. This experiment was followed by venting tunnel gases into the atmosphere for local transport and detection. A borehole drilled back into the cavity produced by the explosion is planned. Additionally, we have also implemented other stand-alone atmospheric release experiments. In this presentation, we outline the experimental conditions and highlight the primary detection mechanisms and results along with plans for future experiments and drilling back into the cavity. Subsequent presentations will cover specific aspects of the experiment such as tracer production/emplacement and measurements of the tracer gases.

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