



Applications in nuclear explosion monitoring using predictive source models for radioxenon discharges from nuclear facilities



Martin Kalinowski¹, Matthias Auer¹, Ted Bowyer², Matthew Cooper², Charlie Doll², James Ely², Paul Eslinger², Judah Friese², Sid Hellman¹, Lori Metz², Mihaela Rizescu¹, Ramesh Sarathi², Brian Schrom², Cari Seifert²

¹Instrumental Software Technologies, Inc. (ISTI), ²Pacific Northwest National Laboratory (PNNL)

P2.3-218

- This poster is about predictive source models
- Created from stack data collected by the Source Term Analysis of Xenon (STAX) project
- Find out how much you can learn from these source models, e.g.
 - At what distance may a source still be detected?
 - Can a release from a MIPF or an NPP ever cause isotopic ratios above the IDC screening threshold when observed in an IMS sample?

Source model	Action	Interpretation
Release pattern over a day, week, or year	Check variability	Is the continuous release assumption reasonable?
Concentration distribution as probability density function	Apply dilution factors	Assess detectability as a function of distance
Parameters like maximum of ¹³⁵ Xe/ ¹³³ Xe isotopic ratio	Determine maximum	Compare with IDC screening threshold



