



# High Resolution Stack Data from Fission Based $^{99}\text{Mo}$ Production

Jl Friese<sup>1</sup>, JL Burnett<sup>1</sup>, TW Bowyer<sup>1</sup>, LA Metz<sup>1</sup>, CG Doll<sup>1</sup>, B  
DeConnick<sup>2</sup>, N Maurissen<sup>2</sup>, E Hoffman<sup>3</sup>, A Gedz<sup>3</sup>, M Corry<sup>3</sup>

1. Pacific Northwest National Laboratory (PNNL)
2. Institute for Radioelements (IRE)
3. The Australian Nuclear Science and Technology Organisation (ANSTO)

# Introduction

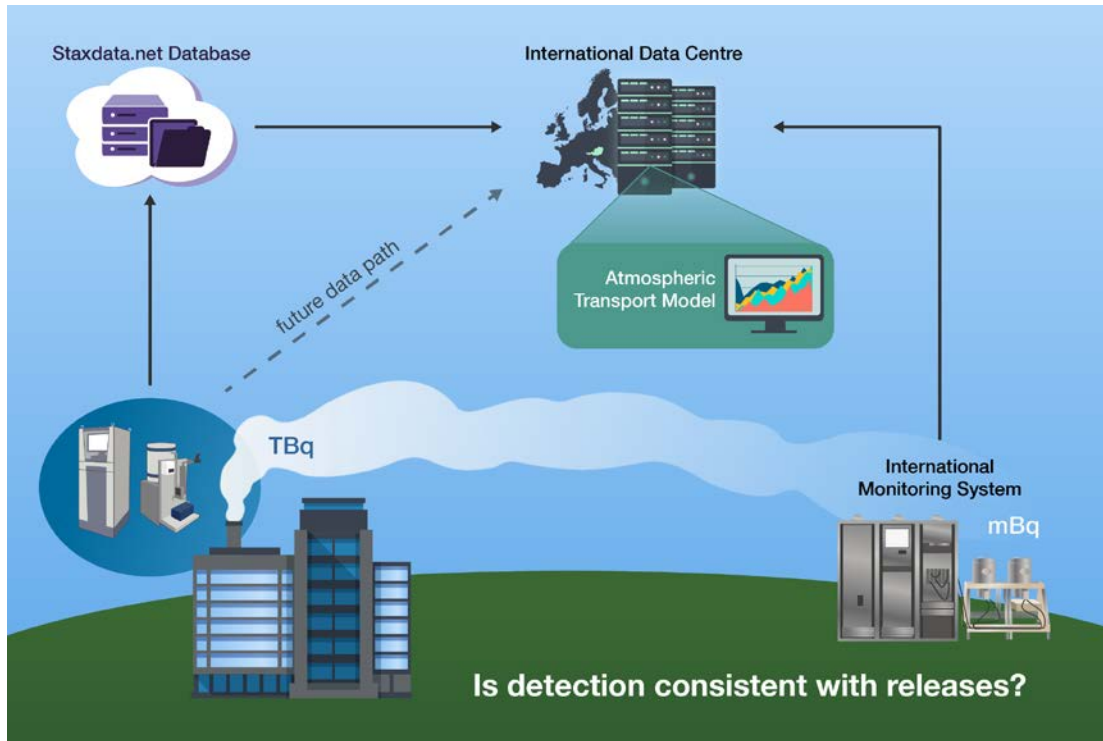
- Institute of RadioElements (IRE) and Australia's Nuclear Science and Technology Organisation (ANSTO) have a history of using high resolution detection systems on fission based production facilities
- Based on their experience, a new detector system was developed with an effort to develop a method to collect and understand fission based xenon data in the context of being used to understand the worldwide radioxenon background
- The Source Term Analysis of Xenon (STAX) project seeks to procure and install an experimental network of stack monitoring systems at isotope production facilities to assist in monitoring for signatures of nuclear explosions

## IRE HPGe System



## ANSTO HPGe System





# Concept Behind the STAX project

- Concept grew and developed from Workshop of Signatures of Man-made Isotope production (WOSMIP)
- Measurement guidelines came from roundtable discussions
  - Further refined with discussions from National Data Centers
- Voluntary partnership with facilities
- Poster T3.5-P75 for more details

# Currently Deployed Detector System



- ▶ Manufacture: Canberra
- ▶ Spectra formats: Modified PHD (STX 1.0)
- ▶ Results format: Modified AAR (ATS)
- ▶ State of health: Modified SOH
- ▶ Poster T3.5-P67 – Data pipeline process



# Future Hardware Providers

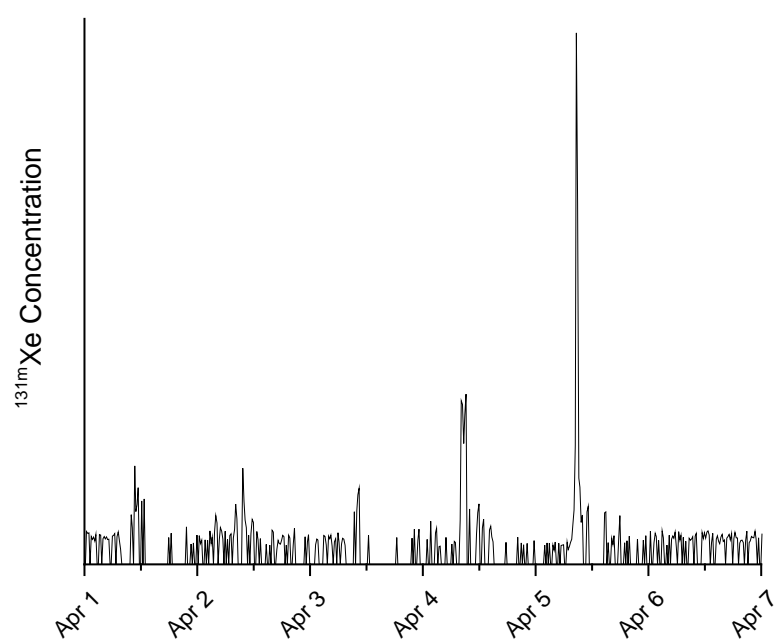
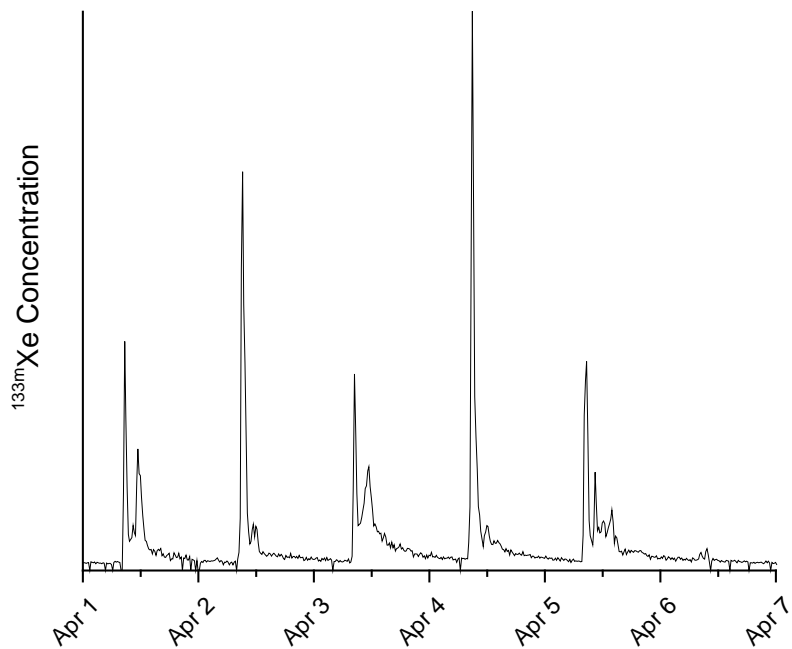
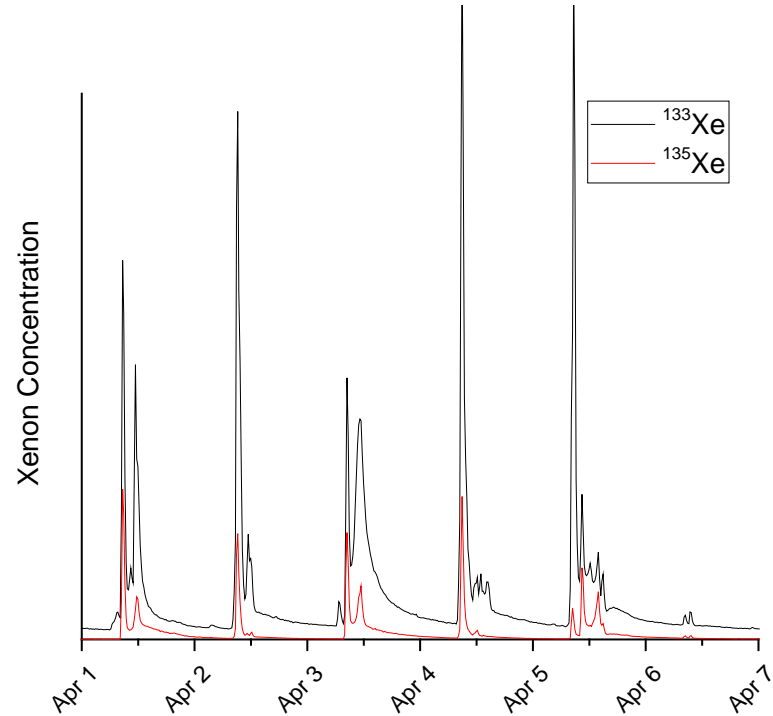
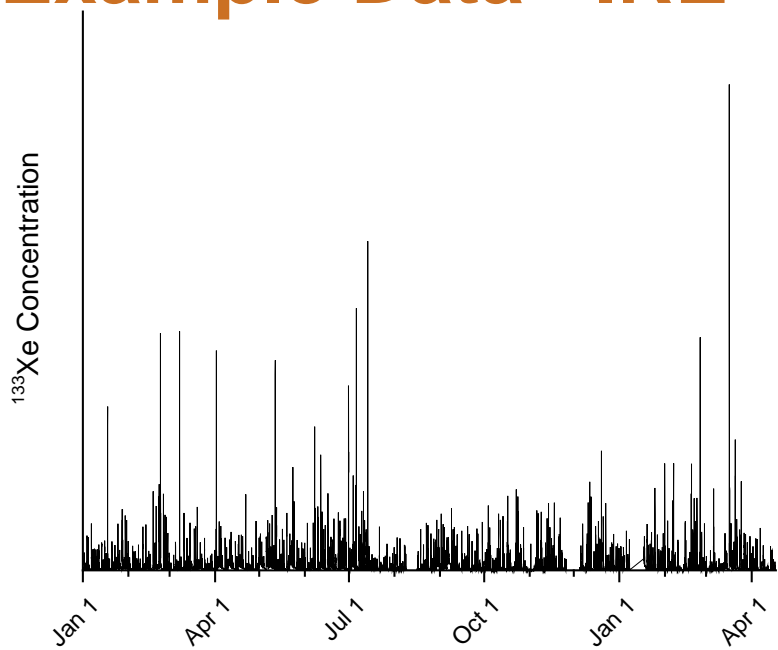
- ▶ INVAP STAX system
  - AEMi new generation



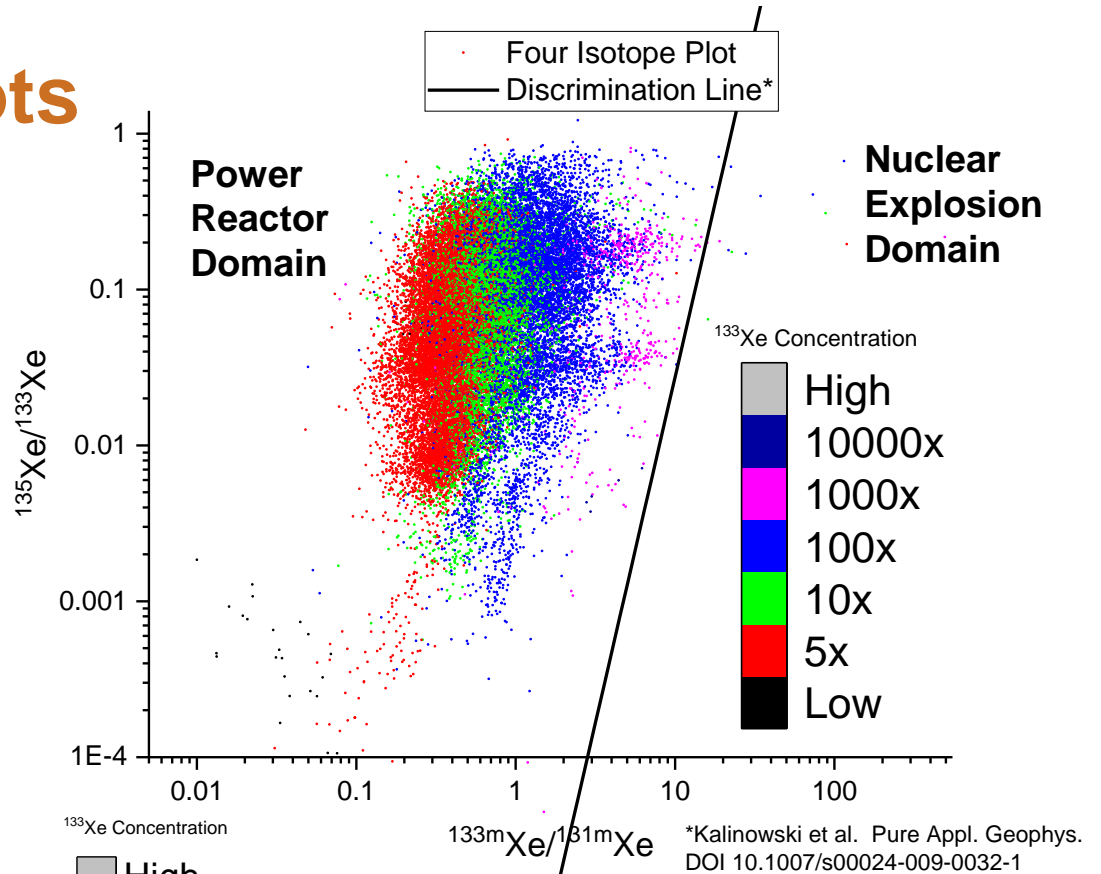
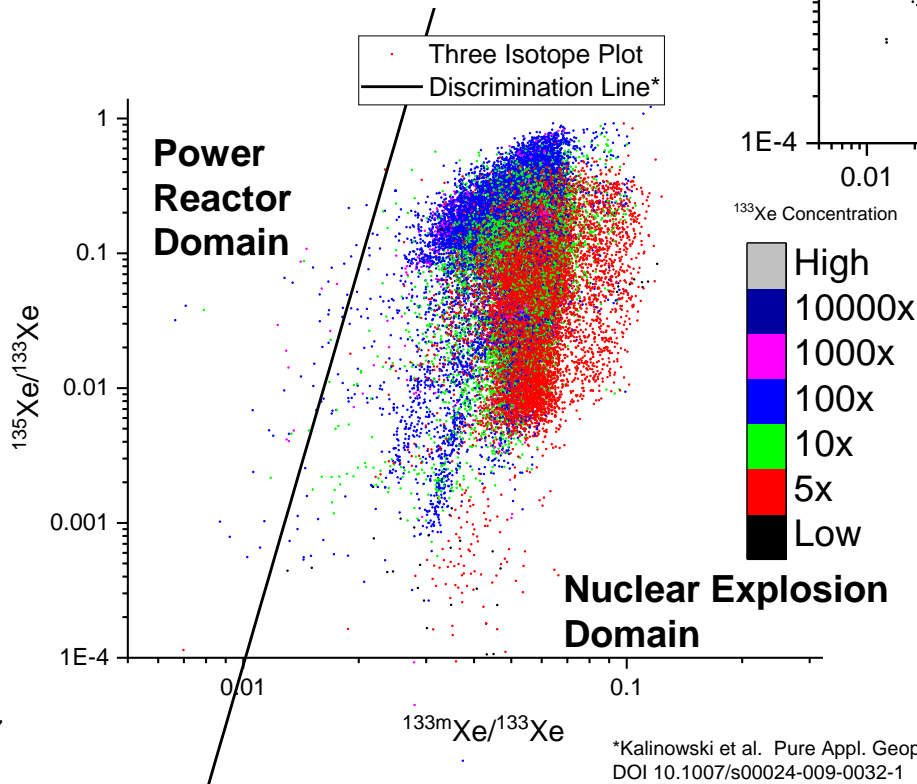
- ▶ VF Nuclear NGM-2000
  - Modification for STAX



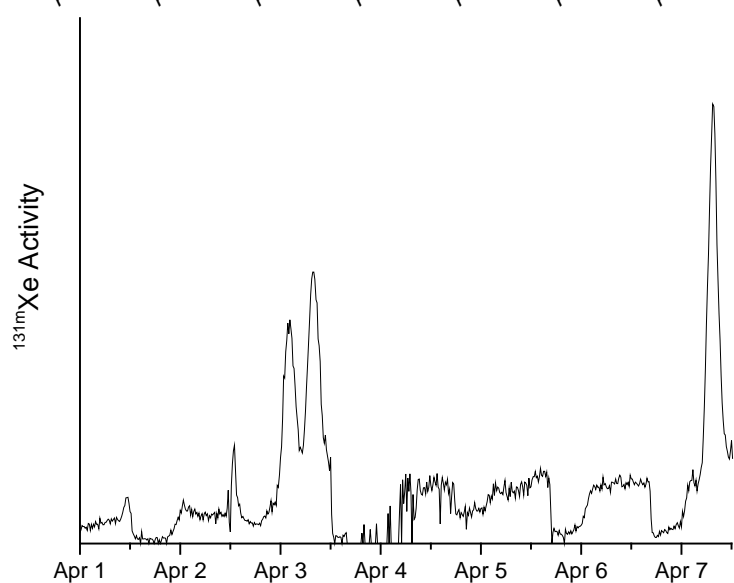
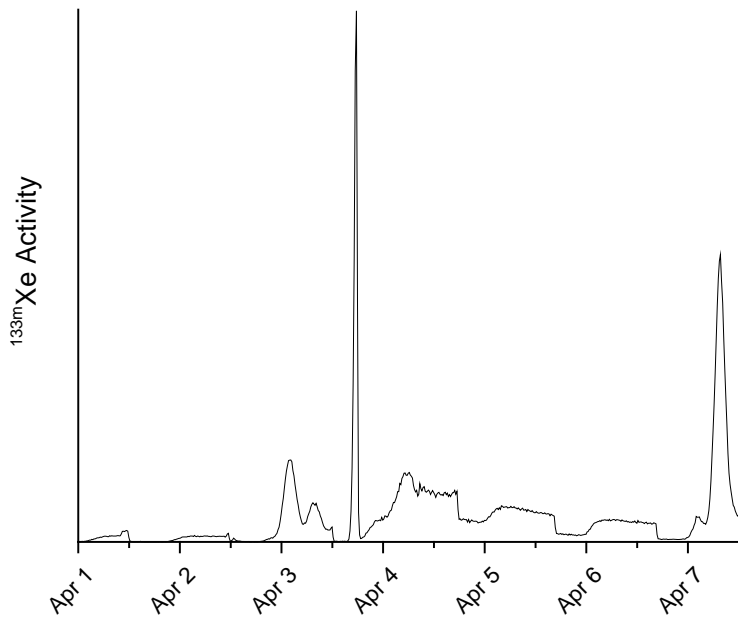
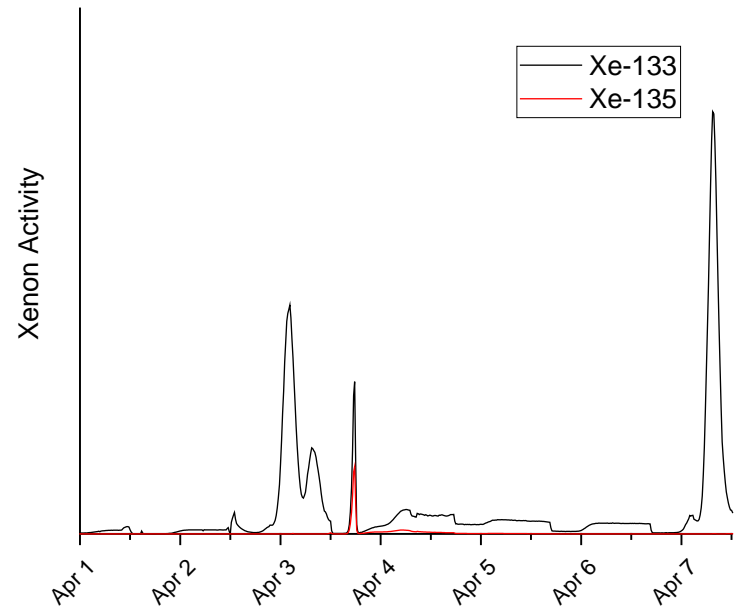
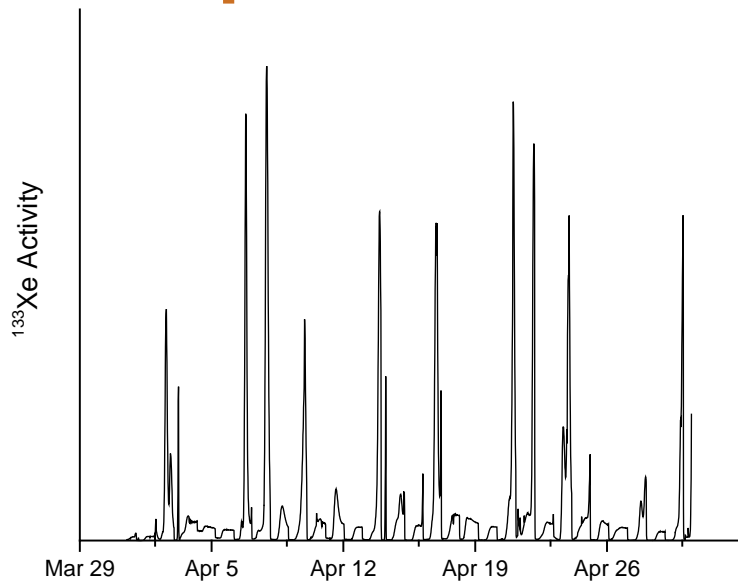
# Example Data - IRE



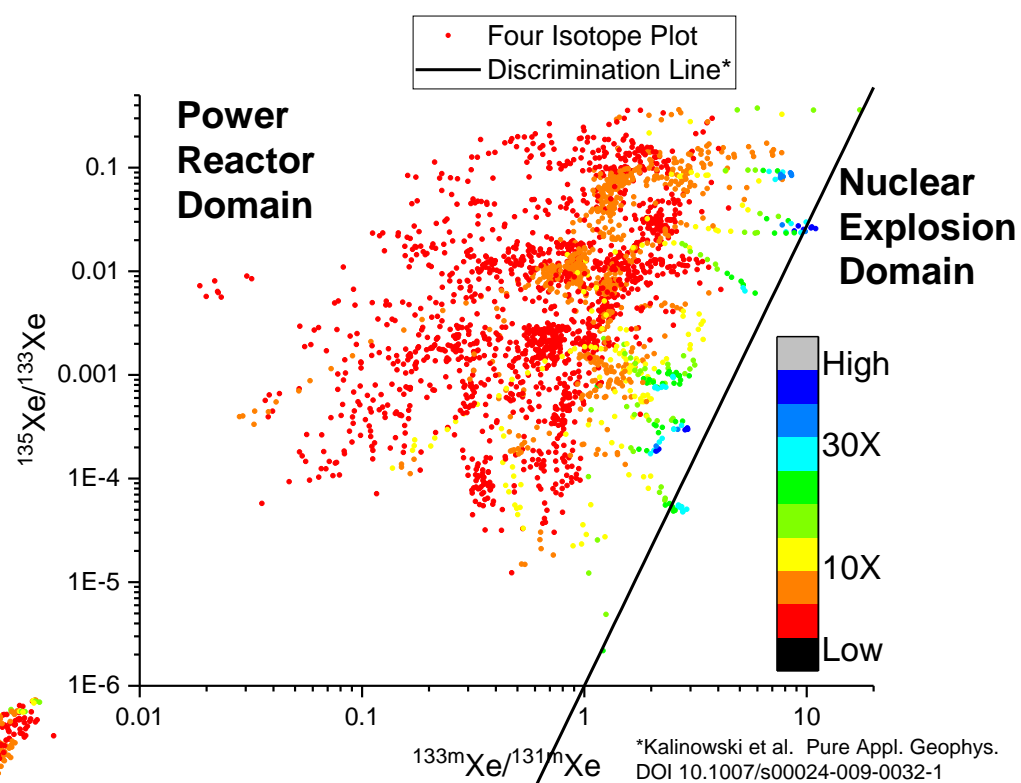
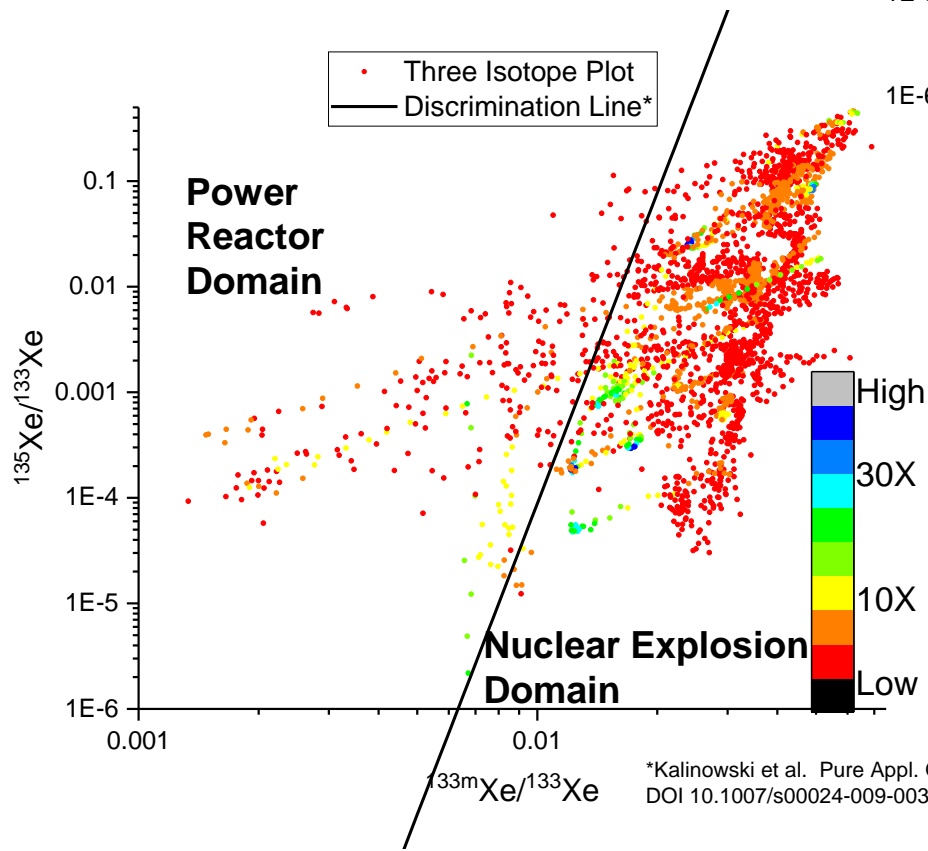
# Multi-Isotope Plots IRE



# Example Data - ANSTO



# Multi-Isotope Plots ANSTO



# Summary

- ▶ The STAX project is seeking to partner with isotope producers to install stack monitoring equipment at no expense to the facility
- ▶ This experimental network, which arose from discussions at WOSMIP, is a continuation of efforts to assist the CTBTO PrepCom and NDCs in monitoring for signatures from nuclear explosions



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