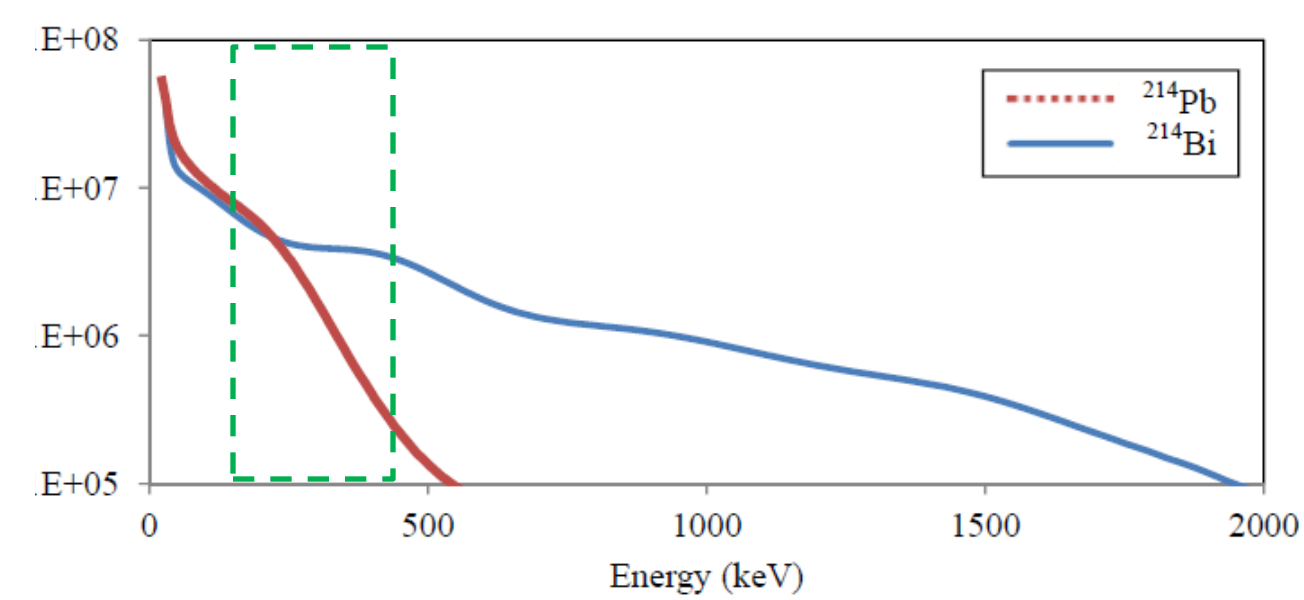


Repurposing the Global Network of Radiation Portal Monitors

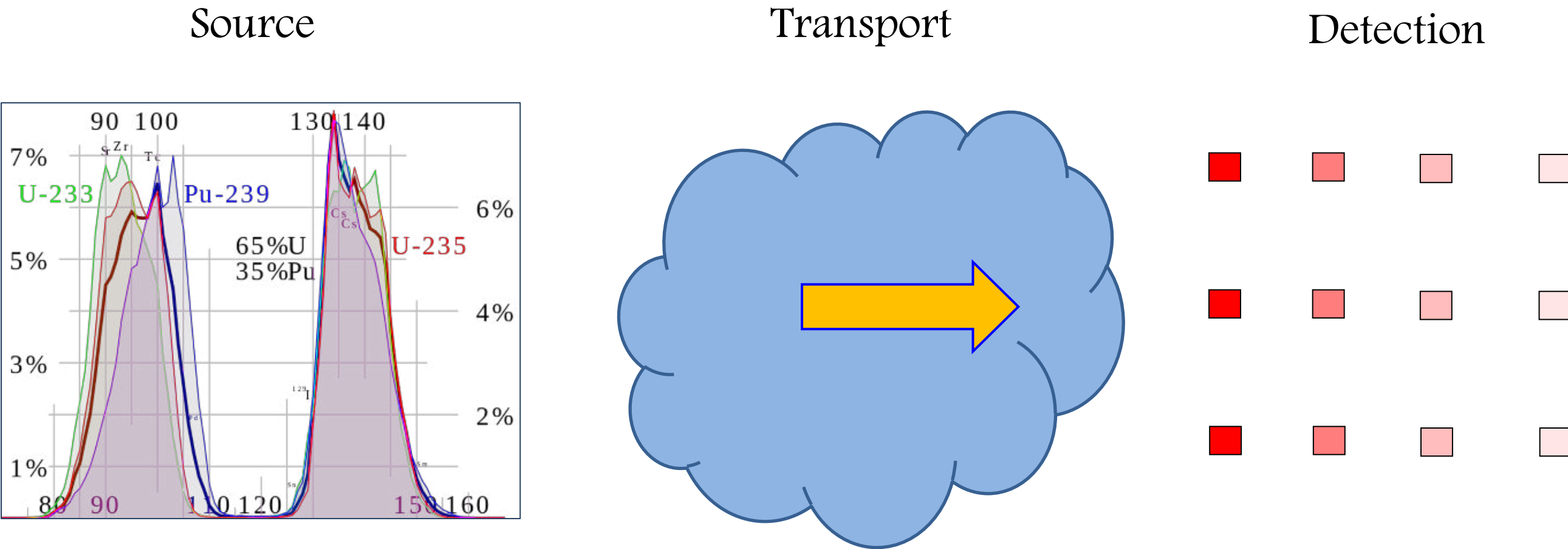
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INTRODUCTION : Radiation Portal Monitors (RPM) have well-documented sensitivity to Radon daughters, Bi-214 and Pb-214, as well as many other isotopes.



Poly Vinyl Toluene (PVT) detectors have very low resolution – but half-lives can be used for identification, from counts in a single (or multiple) energy window(s)

VALUE to CTBTO: Arrays of RPMs can directly probe radon-daughter content of weather systems – which supports the Atmospheric Transport Modelling. Augmenting the existing IMS with RPMs will improve data granularity.



PAST WORK: Background changes can be predicted from the rain structure and the activity density can be extracted from independent normalizations . Livesay, et al, Journal of Environmental Radioactivity 137 (2014), 137–141

Nuclide	Yield (%)	Half-life (a)	Energy (MeV)
¹³⁷ Cs	6.23	30.17	0.662
⁸⁵ Kr	1.33 (*0.5%)	10.72	0.514
¹³¹ I	2.83	8.02 days	0.364, 0.663

Other potential isotopes of interest could be identified by RPMs when they are deposited similarly to radon-daughters.

OTHER POTENTIAL USES: With thousands of RPMs operating throughout the world, the array is substantial and growing. States with deployed RPMs have the opportunity to use their networks as the basis for international collaboration in areas related to:

- Environmental Radioactivity
- Public Health and Safety
- Medical Isotope Tracking (in vivo).

CHALLENGES: Current data sharing is very limited (generally only internally) and as such the global network of RPMs is fragmented. In order to fully realize the goal of repurposing this network, the following conceptual areas must be addressed.

- Data quality and security
- Institutional buy-in
- Analysis workload

