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# of an ultra-sensitive gamma-gamma coincidence system for radionuclide measurements at International Monitoring System stations

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Next-generation gamma-gamma coincidence measurements have the potential to significantly improve the confidence of detection of particulate radionuclides relevant for nuclear explosion monitoring purposes. Sophisticated laboratory systems have demonstrated order-of-magnitude improvements for radionuclides such as Ru-106/Rh-106, Cs-134 and Ce-144. However, the implementation of these systems at IMS particulate stations has been limited by the complexity of acquisition hardware, data processing and analysis techniques required. At Pacific Northwest National Laboratory (PNNL, USA), in collaboration with Mirion Technologies (USA), a prototype system suitable for station deployment is being developed. Designed for practical implementation and operation, the system consists of acquisition electronics that are compatible with the existing station hardware and streamlined software capable of calculating the activity of relevant radionuclides using coincidence algorithms. This presentation discusses the design, validation and performance of the system, and compares the detection sensitivity with standard IMS stations.

Promotional text

The next-generation gamma-gamma coincidence system aims to advance the capabilities of IMS radionuclide monitoring stations. It is aligned to Theme 3: Verification Technologies and Technique Application – Design of Sensor Systems and Advanced Sensor Technologies (T3.1).

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