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# of aerosol radionuclide monitoring

In the 1990s, Pacific Northwest National Laboratory (PNNL) developed the Radionuclide Aerosol Sampler Analyzer (RASA) for worldwide aerosol monitoring. For the last several years, staff of PNNL and Creare have made investigations into aspects of upgrading the RASA. Key themes have been a modular approach to additional radionuclide measurements, optimizing the sampling/analyzing times to improve detection and location capability, and improving the power consumption via the use of electrostatic collection versus classic filtration. These individual efforts have been made in the context of retrofits to the existing RASA. In in this work, we consider a complete RASA redesign at a notional level. Individual studies reported here contain theory and experimental investigations, but none of these has been tested with the others, and further work is needed to verify these gains. With these caveats, this work shows that substantial optimization of detection and location capability of a network of RASA systems is possible, multiple mission spaces can be addressed with additional measurements, and electrostatic collection is a practical advantage, although more work is needed. The quite unexpected result of this study is that some optimization of the existing RASA is possible without any hardware changes at all.

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