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A drone-borne gamma spectrometry system for environmental radioactivity monitoring

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Different sites in France and all around the world are contaminated with anthropic radionuclides or technologically enhanced naturally occurring radioactive materials (TENORM). The spatial distribution of the radioactivity over these large sites is often totally or partially unknown. One of the main difficulties is to find a good compromise between the precision of the radioactivity measurements and the size of the mapped sites. Deep contamination can also poses data correction problems due to soil attenuation. The IPHC laboratory is currently developing a drone-borne gamma spectrometry system dedicated to the environmental radioactivity monitoring. This system used advanced data analysis algorithms, based on Monte Carlo simulation and machine learning algorithms, to achieve a precise estimate of the different radionuclides activity. The experimental validation of the system will be presented for an artifical anthropic punctual contamination using sealed sources. Future applications for radiation protection or geological studies will also be discussed.

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