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3.2-P20. Spatial Deconvolution of Aerial Radiometric Survey Results

An essential component of an on-site inspection is a gamma radiation survey, which is preferably carried out on an aerial platform. An aerial radiometric survey is capable of mapping dose rate or isotope-specific concentrations with high density over a large area in a relatively short time (eg. 8 km^2 in 2.5 hrs with typical flight parameters). The contoured concentration distribution provides a good measure of total radioactivity and of the locations of high and low concentration. However, the aerial system is sensitive to a large area on the ground - of order H^2 where H is the survey altitude. Thus, each measurement in the grid represents an average over this region of sensitivity. This has the effect of smearing the ground-level spatial variation, with the potentially harmful consequence of underestimating the strength of highly localized deposits. We have developed a method to deconvolve a spatial distribution for the smearing caused by the large region of sensitivity. The method can recover some of the sharpness of the ground-level features, including the magnitude of spatially restricted hot spots. In this presentation we show the spatial deconvolution method, and demonstrate the results of the method on both synthetic and real-world data sets.

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