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T3.2-O5. Snapshot Spectral Imaging Technologies for On-Site Inspection

Multispectral and infrared imaging technologies are used in a CTBT on-site inspection (OSI) to search for anomalies and artifacts. During an OSI, spectral imagers can be used from the ground, as well as from the air during an additional overflight. For the airborne acquisition of spectrally resolved images, one common approach used throughout the remote sensing community is a pushbroom scanning spectrometer. However, over the past two decades, snapshot spectral imagers that simultaneously acquire spatial and spectral information have been developed. The advantages of snapshot imaging spectrometers over their scanning counterparts (such as a pushbroom spectrometer) are often application dependent. For example, transient phenomena are difficult to measure accurately with scanning instruments. For OSI, snapshot spectral imagers could enable more flexibility in data acquisition and simplify data processing, but may result in an unacceptable loss of resolution in one or more domains. In the work presented here, we examine the utility of snapshot spectral imagers for OSI. We examine a number of snapshot technologies and determine which are most promising for OSI needs, and compare the performance of these snapshot imagers to conventional scanning approaches with respect to spatial and spectral resolution, as well as signal to noise ratio.

Primary author: JONES, Julia Craven (Sandia National Laboratories)

Presenter: JONES, Julia Craven (Sandia National Laboratories)

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