



Detection and Spatial Mapping of Anthropogenic Methane Plumes with the Hyperspectral Thermal Emission Spectrometer (HyTES)

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Currently large uncertainties exist associated with attribution and quantification of fugitive emissions of greenhouse gases such as methane across many regions and key economic sectors. A number of observational efforts are currently underway to better quantify and reduce uncertainties associated with these emissions, including agriculture and oil and gas production operations. One such effort led by JPL is the development of the Hyperspectral Thermal Emission Spectrometer (HyTES) - a wide swath Thermal Infrared (TIR) airborne imager with high spectral (256 bands from 7.5 - 12 micron) and spatial resolution (~ 1.5 m at 1-km AGL altitude) that presents a major advance in airborne TIR remote sensing measurements. Using HyTES we have developed robust and reliable techniques for the detection and high resolution mapping of small scale plumes of anthropogenic (oil and gas fields, landfills, dairies) and non-anthropogenic (natural seeps) sources of methane in the state of California and Colorado. A background on the HyTES sensor, science objectives, gas detection methods, and examples of mapping fugitive methane plumes in California and Colorado will be discussed. These kind of observational efforts and studies will help address critical science questions related to methane budgets and management of future emissions in California and other regions.