

Remote sensing of large scale Methane emission sources with the Methane Airborne MAPper (MAMAP) instrument over oil fields and landfills in California - Initial results from COMEX

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ABSTRACT:

During several flights performed with the MAMAP (Methane Airborne MAPper) airborne remote sensing instrument in the framework of the CO₂ and MEthane Experiment (COMEX) - a NASA and ESA funded campaign in support of CarbonSat and HypsIRI mission definition activities - large scale methane plumes were detected over oil fields and landfills in California in summer 2014. MAMAP was installed for these flights aboard of the Center for Interdisciplinary Remotely-Piloted Aircraft Studies (CIRPAS) Twin Otter aircraft, together with a Picarro fast in-situ greenhouse gas (GHG) analyzer (operate by the Ames Research Center, ARC), a 5 hole turbulence probe as well as a atmospheric measurement package (operated by CIRPAS), measuring aerosols, temperature, dew-point and other atmospheric parameters. Data collected with the in-situ GHG analyzer will be used for validation of MAMAP remotely sensed data by acquiring vertical cross sections of the discovered plumes at a fixed downwind distance. Precise airborne wind information from the turbulence probe together with ground based wind data from the nearby airport will be used to estimate emission rates from the remote sensed and in-situ measured data. Remote sensed and in-situ data as well as initial flux estimates for oil fields and landfills will be presented. Synergies between hyperspectral and absorption spectroscopic detection of Methane emissions will be discussed.