

Proposed Trace Gas Measurements Over the Western United States for TROPOMI Validation

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The Alpha Jet Atmospheric eXperiment (AJAX), located in the Bay Area of California, is a joint effort between NASA Ames Research Center and H211, LCC. AJAX makes in-situ airborne measurements of trace gases 2-4 times per month, resulting in over 216 flights since 2011. Current measurements include ozone (O_3), carbon dioxide (CO_2), methane (CH_4), water (H_2O), formaldehyde (HCHO), and meteorological measurements (*i.e.*, ambient pressure, temperature, and 3D winds). Currently, the AJAX team is working to incorporate nitrogen dioxide (NO_2) measurements with a Cavity Attenuated Phase Shift Spectrometer (CAPS).

Successful science flights coincident with satellite overpasses have been performed since 2011 by the Alpha Jet, with more than 40 flights under the Greenhouse Observing SATellite (GOSAT) and several flights under the Orbiting Carbon Observatory-2 (OCO-2). Results from these flights, which have covered a range of different surfaces and seasonal conditions, will be presented. In-situ vertical profiles of O_3 , CO_2 , CH_4 , H_2O , HCHO, and NO_2 from the surface to 28,000 feet made by AJAX will also be valuable for satellite validation of data products obtained from the TROPOspheric Monitoring Instrument (TROPOMI). TROPOMI is on board the Copernicus Sentinel-5 precursor (S5p) satellite, with level 2 products including O_3 , CO, CH_4 , HCHO, NO_2 , and aerosols.