A new airborne sensor with the requisite spatial, spectral, and radiometric resolution to characterize “point” sources of ammonia (NH₃) emission has been used to characterize agricultural emissions. The instrument (Mako) is a whiskbroom hyperspectral imager operating in the thermal infrared at 7.6-13.2 μm and has been described previously (Warren et al., 2010; Hall et al., 2011). Flights were conducted over California’s San Joaquin Valley (SJV), which is a region of intensive agriculture and animal husbandry that has been identified as one of the single largest sources of atmospheric free ammonia worldwide (Clarisse et al., 2009, 2010).

Airborne data acquisition operations were coordinated with daytime and nighttime overpasses of the Infrared Atmospheric Sounding Interferometer (IASI) aboard the European Space Agency’s MetOp-A platform. IASI is capable of measuring total columns of ammonia (Clarisse et al., 2009, 2010) and the primary purpose of this investigation was to cross-compare and co-validate the IASI ammonia product against high-spatial-resolution airborne retrievals acquired contemporaneously over the same footprint.