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Remotely-Sensed Ammonia Emission from Fumarolic Vents Associated with a Geothermally Active Fault in the Salton Sea Geothermal Field, California

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Airborne hyperspectral imaging surveys were conducted along the Calipatria Fault as it crosses the SE shore of the Salton Sea in Southern California. The imagery was acquired at ∼50-nm spectral resolution across the 7.6-13.5 micron thermal-infrared spectral region with a ground sample distance of approximately 1 meter. In addition to strong thermal hotspots associated with active fumaroles apparently associated with the fault, spectral analysis of the imagery revealed the presence of ammonia in the intervening air column, presumed to originate from geothermally-induced pyrolytic decomposition of the agricultural runoff that permeates the lake water and sediment. All emission sources detected lay along the Calipatria Fault itself, which is one of the most hydrothermally active in the Salton Sea Geothermal Field. Geothermally sourced ammonia has been previously reported from a variety of locations around the world; this paper reports on a sensitive means for surveying and monitoring such emissions remotely.