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Volcanic Gas Emissions Mapping Using a Mass Spectrometer System
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Introduction
The visualization of hazardous gaseous emissions at volcanoes using in-situ mass spectrometry (MS) is a key step towards a better comprehension of the geophysical phenomena surrounding eruptive activity. In-situ gas data consisting of helium, carbon dioxide, sulfur dioxide, and other gas species, were acquired with an MS system. MS and global position system (GPS) data were plotted on ground imagery, topography, and remote sensing data collected by a host of instruments during the second Costa Rica Airborne Research and Technology Applications (CARTA) mission. This combination of gas and imaging data allowed 3-dimensional (3-D) visualization of the volcanic plume and the mapping of gas concentration at several volcanic structures and urban areas. This combined set of data has demonstrated a better tool to assess hazardous conditions by visualizing and modeling of possible scenarios of volcanic activity. The MS system is used for in-situ measurement of three-dimensional gas concentrations at different volcanic locations with three different transportation platforms, aircraft, auto, and hand carried. The demonstration for urban contamination mapping is also presented as another possible use for the MS system.

Results and Discussion
Data Collected
- Concentration
- GPS
DATA Plotted
- On 3-D Image of Area
- Position of Plume are Visible in 3-D Model

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