

The Potential Use of Earth Observing System Data to Monitor Volcanic Sulfur Dioxide Emissions From Space

V J Realmuto (MS 168-514, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, 91 109; 818-354-1 824; e-mail: vince.realmuto@jpl.nasa.gov)

The launch of NASA's Earth Observing System (EOS) AM-1 platform in 1998 will put two multi spectral thermal infrared (TIR) imaging instruments into Earth orbit. The Advanced Spaceborne Thermal Emission and Reflectance Radiometer (ASTER) will provide TIR image data with a spatial resolution of 90 m (at nadir), while the Moderate Resolution Imaging Spectrometer (MODIS) will provide TIR imagery with a spatial resolution of 1 km (at nadir). Both ASTER and MODIS will possess spectral channels that span the sulfur dioxide (SO₂) spectral features at 8.5 μm.

Data collected during deployments of the airborne Thermal Infrared Multispectral Scanner (TIMS) over Mount Etna and Kilauea volcanoes demonstrate the potential contributions of TIR imagery to volcano monitoring. These data have been used to determine that the Etna and Kilauea SO₂ plumes will fall within the detection limits of MODIS and ASTER, respectively. The ability to map low-altitude, quiescent SO₂ plumes from space will augment the existing capabilities of the satellite-borne Total Ozone Mapping Spectrometer (TOMS) and Advanced Very High Resolution Radiometer (AVHRR) instruments to map the SO₂ and ash clouds resulting from explosive eruptions.

The SO₂ monitoring programs at Mount Etna, Kilauea, Mount Erebus, and Mount St. Helens have demonstrated the benefits of collecting frequent emission rate measurements over extended period of time. It is anticipated that ready access to EOS data sets, together with the software tools required to analyze these data, will facilitate the long-term documentation of SO₂ emission rates.

1. 1997 Fall Meeting
2. 0821784
3. (a) V J Realmuto
MS 168-514
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, CA 91109
(b) 818-3554-1824
(c) 818-393-6962
(d) vince.realmuto@jpl.nasa.gov
4. **V**
5. (a) V-09, Remote Sensing of
Active Volcanism

(b) 8419 Eruption monitoring
8409 Atmospheric effects
8494 Instruments and
techniques
6. Oral presentation
7. 75% published in JGR-Solid
Earth
8. \$60.00 check enclosed
9. I (Pete Mouginiis-Mark, session
co-chair)
10. **NONE**
11. **NO**