2003 Fall Meeting
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HR: 0830h
AN: **U31B-0002**
TI: Seismo-acoustics, VLP and ULP signals, and other comparisons of surface broadband and CALIPSO borehole data at Soufriere Hills Volcano, Montserrat, B.W.I.
AU: *** Hidayat, D**
EM: *hidayat@geosc.psu.edu*
AF: *Dept. of Geosciences, Penn State University, 542 Deike Bldg, University Park, PA 16802 United States*
AU: **Voight, B**
EM: *voight@ems.psu.edu*
AF: *Dept. of Geosciences, Penn State University, 542 Deike Bldg, University Park, PA 16802 United States*
AU: **Mattioli, G**
EM:
AF: *Dept. of Geosciences, University of Arkansas, 113 Ozark Hall, Fayatteville, AR 72701 United States*
AU: **Young, S R**
EM:
AF: *Dept. of Geosciences, Penn State University, 542 Deike Bldg, University Park, PA 16802 United States*
AU: **Linde, A T**
EM:
AF: *Department of Terrestrial Magnetism, Carnegie Institution of Washington, 5241 Broad Branch Road, NW, Washington, DC 20015 United States*
AU: **Sacks, I S**
EM:
AF: *Department of Terrestrial Magnetism, Carnegie Institution of Washington, 5241 Broad Branch Road, NW, Washington, DC 20015 United States*
AU: **Malin, P E**
EM:
AF: *Division Earth/Ocean Sciences, Duke University, 109A Old Chemistry, Durham, NC 27708 United States*
AU: **Shalev, E**
EM:
AF: *Division Earth/Ocean Sciences, Duke University, 109A Old Chemistry, Durham, NC 27708 United States*
AU: **Elsworth, D**
EM:
AF: *Dept. of Geosciences, Penn State University, 542 Deike Bldg, University Park, PA 16802 United States*
AU: **Widiwijayanti, C**
EM:
AF: *Dept. of Geosciences, Penn State University, 542 Deike Bldg, University Park, PA 16802 United States*
AU: **Herd, R**

EM:
AF: *Montserrat Volcano Observatory, Fleming, Montserrat, 1600 Montserrat*
AU: **Thompson, G**
EM:
AF: *Montserrat Volcano Observatory, Fleming, Montserrat, 1600 Montserrat*
AU: **Bass, V**
EM:
AF: *Montserrat Volcano Observatory, Fleming, Montserrat, 1600 Montserrat*
AB: Project CALIPSO (Caribbean Andesite Lava Island-volcano Precision Seismo-geodetic Observatory) investigates with borehole and surface instruments the magmatic system at the very active Soufriere Hills Volcano (SHV), Montserrat, supplementing surface monitoring systems of the Montserrat Volcano Observatory, and those of other institutions including PSU and U Ark. Many aspects of andesitic magmatic system dynamics remain little understood despite significant monitoring and research efforts, and CALIPSO is expected to improve our understanding of SHV and of andesitic magmatic systems generally. As an example of such studies, we examine data from the 12-13 July 2003 major lava dome collapse and eruption of SHV. The analyses illustrate the opportunity to evaluate seismic and volumetric strain signals in very-long period (VLP, {$\sim$}10 s) and ultra-long period (ULP, {$\sim$}100 s) ranges, as well as the long period (LP, {$\sim$}1 s) and short period ({$\sim$}0.1 s) ranges typically considered. The strainmeters act as very-broad-band instruments, and not only detect quasi-static strain changes, but also dynamic strains equivalent to the response of a volumetric seismometer from high frequencies to ULP. Waveforms from several broadband seismometers and three strainmeters installed around the volcano indicate VLP and ULP signals in association with the explosive events. Additional information is derived from infrasonic microphones installed at two PSU surface broadband stations prior to the July 2003 events. Combining information from infrasonic pressure waves in the air with broadband seismicity and dynamic strain aids understanding of eruption dynamics and the physical eruptive processes.
DE: 7280 Volcano seismology (8419)
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