2003 Fall Meeting
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HR: 1330h
AN: **V52B-0435**
TI: Volcanic SO2 Emissions vs. Seismicity - July 2002 LP Swarm, Soufriere Hills Volcano, Montserrat
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AB: Volcanic sulfur dioxide (SO2) measurements of passive plumes have recently improved with the application of Differential Optical Absorption Spectroscopy (DOAS). In January 2002, the Montserrat Volcano Observatory installed two fixed DOAS instruments which collect rapid, continuous measurements of SO2 emissions. For the first time, SO2 fluxes are being collected on a time scale of minutes, allowing short-term changes to be evaluated with respect to atmospheric transport, surface activity, and magmatic source mechanisms. In this study, we investigate relationships between SO2 emissions and seismicity for July 2002 at Montserrat. The seismic data consist of rockfall, long-period rockfall, hybrid, and long-period (LP) waveforms. Seismic energy increased slowly throughout July, culminating in a swarm of long-period earthquakes. The SO2 data used for this study consist of measurements collected every 4-5 minutes from approximately 8 a.m. to 5 p.m. daily by a DOAS instrument positioned at Lovers Lane (~4.5 km west of vent). From July 1-18, seismicity is dominated by rockfalls with intermittent hybrids and LPs. During this time, SO2 fluxes generally increase and coincide with an increasing trend in the number of rockfalls per day. Average daily SO2 fluxes range from 140 to 1256 tonnes/day with an average of 616 tonnes/day. On July 19, however, the average daily SO2 flux decreases from a monthly maximum of 1256 tonnes/day to 227 tonnes/day and continues to average only 326 tonnes/day from July 20-30. July 19 marks a seismic transition into a LP earthquake swarm that continues into August. After the LP swarm begins and SO2 fluxes decrease, however, the number of daily rockfalls remains relatively high. Therefore, it appears that LPs are more strongly linked to SO2 emissions than rockfall activity. Future work will involve investigating short-term (minutes/hours) relationships between seismicity and SO2 emissions.
DE: 7280 Volcano seismology (8419)
DE: 8419 Eruption monitoring (7280)
SC: Volcanology, Geochemistry, Petrology [V]
MN: 2003 Fall Meeting

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