Geophysical Research Abstracts,
Vol. 11, EGU2009-9674-1, 2009
EGU General Assembly 2009

The ASTER Urgent Request Protocol: A semi-automated, high resolution SO_2 retrieval scheme

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The ASTER Urgent Request Protocol (URP) aims to provide rapidly returned emergency observations of natural hazards. The protocol will utilise thermal alerts from sensors with a higher temporal and lower spatial resolution (MODIS, GOES, AVHRR) to act as a trigger for an ASTER retrieval. One aspect of the URP is the observation, and ultimately quantification, of climatologically active species; in particular, volcanic SO_2. The high spatial resolution of ASTER allows the retrieval of low level, passively degassed $SO_2$where other instruments (e.g. MODIS, SEVIRI) may fail.

Here we present a methodology where volcanic SO_2 will be rapidly processed using ASTER by a semi-automated procedure. In the first instance a decorrelation stretch will automatically be performed on the MODIS imagery corresponding to the thermal alert. The decorrelation stretch provides visual information about the constituents and relative extent of the plume; sulphur dioxide appears yellow, sulphates and ash are red and ice and water appear blue. The MODIS product will then be used to direct the ASTER request and a decorrelation stretch on ASTER bands 14, 13 and 11 (11.3 μm, 10.6 μm and 8.6 μm) will be automatically generated. From this, viable retrieval scenarios will be selected and processed using the MODTRAN algorithm to produce a quantitative SO_2 retrieval.