Modelling Ground-had and Galileo Observations of Volcanism on Io.

Ashley Gerard Davies, JPL - Caltech, Pasadena, CA 91109, USA.
(agd@kookaburra.jpl.nasa.gov).

Io is the most volcanically active body in the Solar System. Large thermal outbursts of volcanic origin have been observed from ground-based telescopes (see Veeder et al., 1994, *JGR, 99*, 17095-17162). The Loki Patera region of Io was observed in eruption in January 1990, becoming the first eruption on Io to be observed multispectrally. It appears that this event, one of the largest thermal outbursts yet seen, is a silicate eruption on a scale not seen since the Lunar mare basalts were emplaced.

Analyses of these observations show the high temperature nature of the eruption taking place, ruling out dominantly sulphur or sulphur dioxide eruptions, and the trends of thermal output at 4.8 and 8.7 microns indicate a two-component eruption. These components are, firstly, an area at silicate liquidus temperatures which is interpreted as a zone of fire fountains, which feed the second component, a lava flow unit, the surface of which cools rapidly as a function of its age (Davies, 1996, *Icarus*, in press). However, the scale of these silicate events is dwarfed by the size of eruptions of other materials, as shown by released Galileo SSI observations, which tend to confirm the scale of the activity taking place in the Loki Region.

Presently the Galileo spacecraft is orbiting Jupiter and carrying out an Io volcano watch. The NIMS (Near Infrared Mapping Spectrometer) instrument on board will yield both compositional and thermal data of volcanic units on Io, and will hopefully answer some long standing questions as to the nature of volcanism on Io.

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