# Io's Volcanic Thermal Emission at the Galileo Epoch: Recent Results Placed Within the Context of a Decade of IJW Observations

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Between the time of submission of this abstract and the meeting, we will have several observing runs dedicated to measuring Io's mid-infrared volcanic thermal emission during the first orbit of the Galileo spacecraft. This talk will focus on these recent results and how they compare with similar measurements that we have been making since 1983 using the NASA IRTF and other telescopes as part of the IJW program. Through this comparison, we hope to establish the historical context in which the new Galileo results should be viewed. It is virtually certain that the Galileo SS1, NIMS, and PPR instruments will show striking evidence of extreme volcanic surface activity, as did Voyager. 'This paper will focus on whether the activity Galileo detects should be considered as unusual (catastrophic) or normal (uniformitarian) on Io.

Through 1993, the main results of our program of mid-infrared Io radiometry are published in Veeder et al. (J.Geophys. Planets 99, 17095-17162, 1994). The observati ens, augmented with more recent data, define the baseline and range of historical brightness variations at wavelengths from 4.8 to 20 micrometers at all orbital longitudes. This wavelength range includes the region of the peak of Io's volcanic thermal emission and spans a gap in Galileo's spectral coverage between the NIMS and PPR instruments. Modelling these data show that Io's surface consists of 2 units with very different thermal properties: in addition to a conventional LTE surface unit_ covering **18% of** Io, **a** "heat reservoir" unit covers 80% of 10. The mid-IR flux from the 2% of surface area in thermal anomalies is influenced by the "thermal pedestal effect" which plays an important role for the large warm areas that dominate the global heat flow. Heat flow averages >2.5 W/m2 and has been constant within 15% since 1983.

Our program also includes occultation measurements that we use to construct 10 km scale resolution maps of the thermal emission from Loki in 1991. A new series of occultations will begin in 1997. We are attempting disk-resolved mid-IR imaging with the Palomar 5-m. Results from these efforts may be used to illustrate points pertaining to the volcanic cent-ext of the Galileo observati ens.