

Io's Thermal Regimes and non-SO₂ Surface Constituents.

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There are a number of features in the infrared spectra, obtained by the Galileo Near Infrared Mapping Spectrometer (NIMS) instrument, of Io's surface that are not related to the absorptions of SO₂. Some of these features appear to correlate remarkably well with visible albedo. Most notably, the 3.15 micron absorption feature has a positive correlation with visually white material, principally in the equatorial region. The 3.15 micron feature was detected by Salama et al. (1990) and interpreted as an H₂O feature. The feature was apparent in NIMS spectra (Carlson, et al., 1997) and interpreted as a possible O-H stretch transition, implying hydrated minerals, hydroxides, or perhaps water. However, the constituents contributing non-SO₂ features to Io's spectrum have not yet been unequivocally identified. The spatial relationship between the occurrence of the absorption at 3.15 microns and thermal regimes on Io provides constraints on the physical properties of candidate materials. Mapping of non-SO₂ features is based on the full spectral distant observations obtained by NIMS during the Galileo prime and GEM mission phases utilizing spectral mapping techniques developed by L. Soderblom. These techniques can map spectral features as small as about 0.5%. They clearly map absorptions not attributable to SO₂ at 3.15 and 2.37 microns and weakly map absorptions at 1.7 and 4.6 microns.

F. Salama *et al.*, (1990) *Icarus*, **83**, 66-82

R.W. Carlson *et al.*, (1997) *Geophys. Res. Lett.* **24**, 2479

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