Infrared Spectrophotometry of Io between 3-13 μm.

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Infrared observations of Io were collected at the NASA Infrared Telescope Facility, Mauna Kea Hawaii on February 7 and 8, 1993 using the Aerospace Corp. liquid-He-cooled spectrograph. The instrument used two 58-element Blocked Impurity Band (BIB) linear arrays to cover the 3-13 μm wavelength region with a resolving power of 30 - 120. All spectral elements were observed simultaneously. The central meridian of the disk of Io, ranged between 225° - 260° West longitude on February 7 (Trailing Hemisphere) and between 70° - 105° West longitude on February 8 (Leading Hemisphere). The broad spectral range covered contains reflected solar radiation, emission from thermal anomalies (i.e. volcanic regions), and background emission from solar heating of the surface.

Thermal emission from the leading hemisphere varied less than 2% on February 8. Emission from the trailing hemisphere on February 7, increased throughout the night by roughly 30%. The increase in emission with increasing west longitude is consistent with that expected by the volcanic region Loki (309° West longitude, 10° North latitude) approaching the center of the observed disk. The emission levels measured, however, indicate that Loki was in a period of relatively low activity. The absorption feature due to SO₂ frost is present at 4.08 μm. The band depth, measured using the values at 3.47 μm for the continuum and at 4.08 μm for the band minima, was roughly 50% on both the leading and trailing hemisphere. The band depth varied by less than 10% in the regions measured.

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