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Abstract Title: MID-INFRARED SPECTROPHOTOMETRY OF SATURN''S RING SYSTEM

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Abstract Text:

We observed Saturn' s main rings at the NASA/InfraRed Telescope Facility (IRTF) from 1995 to 2003 with MIRLIN, a 10-micron camera at several diagnostic wavelengths in the 8- to 24-micron spectral window, covering one fourth of a Saturnian year, and followed the progressive march of the rings from their edge-on presentation at the equator in 1995 to their maximum opening, obscuring the northern pole of Saturn. Our preliminary results indicate that the brightness temperature of the rings peaks near 18 microns. There also exists an asymmetry between the East and West ansae of few degrees. This is similar to

the near-infrared albedo asymmetry between the ansae and reflectivities at visible wavelengths. Our current efforts are aimed at modelling the ring opacities in the mid-infrared as function of changes in solar elevation angle, inclination and phase angles of the rings. In particular, the A ring had changed from being edge on in 1994 to completely unshadowed in 2003. These observations will provide constraints on thermal asymmetries and opacity of the ring. Current thermal models will be validated against these observations and previous data sets acquired by Voyager and ISO and data to be acquired by Cassini and possibly SIRTF and SOFIA.

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