

# **THERMAL AND ENERGY BALANCE MEASUREMENTS OF SATURN'S C RING**

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Infrared measurements of Saturn's rings were obtained by the Voyager infrared interferometer spectrometer (IRIS) during the Voyager 1 and 2 flybys in the early 1980's. We have analyzed several IRIS observations of the lit and unlit C ring, in conjunction with the Voyager photopolarimeter (PPS)-derived optical depths, to derive ring brightness temperatures. Voyager 1 low phase angle observations of the unlit side of the C ring yield brightness temperatures that are at least 5 degrees warmer than higher phase angle (above 135 degrees) observations of the C ring at similar resolution and local time. These results are consistent with slowly rotating C ring particles.

A noticeable temperature variation is also present in the unlit radial profile of the C ring. The C ring temperature decreases with increasing distance from Saturn. We examined the influence of Saturnshine on this radial temperature profile. Ring particles are mainly heated by the absorption of direct solar light but they can also absorb solar radiation reflected by Saturn, Saturn IR emission and energy emitted by neighboring ring particles. Saturn's contribution alone cannot account for the radial variation of the observed temperature structure. Analysis of the combined Voyager IRIS and PPS data sets indicates that other factors such as particle Bond albedo or particle spacing play a role as well.

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