



## **CIRS observations of ring particles in Saturn's shadow: First results**

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In 2004, the CASSINI-CIRS Composite Infrared Spectrometer observed Saturn's ring particles crossing the planetary shadow on two different occasions. Particles cool within the shadow and warm up when exposed to the Sun after a few hours of transit. This thermal transient event allows us to probe the thermal properties of the first millimeters of the surface regolith, the structure of which is actually unknown. Thanks to its large coverage of the infrared domain (7-1000  $\mu\text{m}$ ), CIRS is able to detect the peak of thermal emission of icy bodies at Saturn's distance and its focal plane FP1 is perfectly adapted to scrutinize ring temperatures. The first observation of the shadow happened on July 2nd, 2004 just after the CASSINI-HUYGENS probe orbit insertion. The second took place around the next Saturn closest approach on October, 28th 2004. For the first time, Cassini's unique viewing geometry allowed for a determination of ring temperature variation across the shadow for all three main rings, A, B and C. Both observations were made at different viewing angles, from the East ansa and from the West ansa respectively, at a phase angle of about  $105^\circ$ . How the temperature decreases in the shadow with diverse viewing angles is strongly indicative of the thermal inertia, spin rate and spin direction of ring particles (Ferrari and Leyrat 2005). These measurements will be compared to previous Voyager IRIS measurements made in the C ring and to recent mid-infrared ground-based observations of ring particles warming up after the shadow crossing. First implications on the rotation and thermal properties of ring particles will be discussed.