



Time variations of the surface temperatures of Saturnian ring particles

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The ring system of Saturn is made up of a large number of icy bodies with sizes ranging from mm to tens of meters. These particles are kept from being collected into a few large objects by the tidal effect of Saturn. The interior and surface structures of individual ring particles are still unknown. One possibility holds that their surfaces are all covered by a layer or mantle of loosely-bounded dust particles. The Cassini measurements by the remote-sensing instruments such as the optical camera and infrared spectrometer will provide detailed mapping of the spatial variations of the brightness distribution and temporal changes of the surface temperatures of the rings. We have constructed a numerical model to simulate the temperature variations of the ring particles at different orbital positions as they move around Saturn. The numerical results will provide useful constraints on the physical property of the surface layers of the ring particles in different regions.