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An Exospheric Model of Iapetus

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Because of its remarkable asymmetry in its surface albdeo distribution, Iapetus has been the focus of attention since its first discovery. The Cassini observations in 2004 have given us a new of this icy satellite of medium size. The measurements of the surface temperature are of particular value for the understanding of the sublimation history and surface transport of volatile ice on Iapetus. For example, we are interested in knowing the possible time variations and surface distributions of the N2, CO2 and other gas molecules if a tenuous exosphere can exist. For this purpose, a thermal model with the albedo asymmetry has been constructed. The computed surface temperature distribution is used as input to a Monte Carlo model of the ballistic transport of the gas molecules across the surface of Iapetus. This numerical simulation is performed in preparation of the close encounter observations with Iapetus by the Cassini spacecraft in 2008.