



The Influence of Space Environment on the Evolution of Mercury

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Mercury, due to its unique close location to the Sun, is surrounded by an environment whose conditions may be considered as 'extreme' in the frame of our solar system. Actually, both solar wind and radiation are extremely strong, so that their interaction with the planet cause high emission of material from its surface. Moreover, the meteoritic precipitation plays a significant role in such emission processes. This material is partially lost in space. Although in the present conditions such a loss seems not to be able to produce significant erosion of the planetary total mass and volume, the long-term effects over billion of years should be carefully considered for a full understanding of the planet's evolution. In fact, in the early stages, under even more extreme conditions, such processes were much more effective in removing material from the planet's surface. This study attempts to provide a rough estimation of the material loss rate as a function of time, in order to evaluate whether and how this environmental effect can be applied for understanding the surface evolution. Such evaluations may be corroborated by the new measurements obtained from Messenger as well as from ground observations. In fact, the new data related to the planet's exosphere can constitute a realistic input for more reliable computations.