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Ion sputtering production on NEO

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Emission of Energetic Neutral Atoms (ENA) can occur when energetic ionized particles impinge upon a surface. This ion-sputtering process is active in many planetary environments in the Solar System where plasma reaches directly the surface (for instance, Mercury, Moon, Europa). In particular, solar wind sputtering is one of the most important agents causing resurfacing and erosion of the surface of a Near Earth Object (NEO). The energy distribution of ion-sputtering picks at few eVs and extends up to hundreds eVs. Given the low escape velocity of a NEO, the sputtered neutrals have enough energy to travel on straight lines and escape from planetary gravity and thus transport information on the originating ions far from their location. Detection and mass-analysis of this ENA signal will give important information on the effectiveness of ion-sputtering as well as on surface loss processes and relative surface composition. Definition of the surface properties of a NEO and interpretation of its interactions with solar wind can provide important information about its surface evolution and, finally, about the global evolution history of the body. In this work, an attempt to analyze the processes that take place on the surface of these small airless bodies as a result of exposure to the space environment, has been realized. The results are compared with similar estimations performed for different environments.