



Laboratory investigation of the ion sputtering process on airless body surfaces

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Research on the Solar System airless bodies surface and environment could be enriched by the detection of the escaping material, in terms of energy and direction, caused by the process of ion-sputtering. This is one of the most important release processes causing alteration of the surface and generating the peculiar environment of the body. Space instrumentation dedicated to such investigation is already included in the payload of some present and future missions to: Mercury (NASA/JAXA Bepi-Colombo), Moon (Indian Space Agency, Chandrayan I), asteroids (ESA Cosmic Vision, Marco Polo), Europa (ESA Cosmic Vision, Laplace) and Enceladus (ESA Cosmic Vision, TANDEM).

We propose a comprehensive facility at INAF/IFSI in Rome intended to provide the opportunity to investigate the interaction of selectable ion beam with planetary analogues through the detection of sputtered neutral atoms. The laboratory is equipped with a high volume HV chamber, ion selectable sources in the range 0 to 5 keV, a set of 3D sample/sensor orientation motion actuation motors. The laboratory will support a set of neutral sensor heads sets derived from the Emitted for Low Energetic Neutral Atoms (ELENA) instrument under development for the ESA BepiColombo Mercury mission able to detect neutral atoms (few eV-up to 5 keV).