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A facility to study the particles released by ion sputtering process

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Research on the planetary surface erosion and planetary evolution could be enriched with the detection of the escaping material, in terms of energy and direction, caused by ions sputtering. A complete study of emitted neutral distribution from which infers the processes occurring on the impacted surface requires dedicated instrumentation, tailored on the peculiarity on the low energy profile of the sputtered signal.

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 UHV chamber, ion selectable sources in the range 0 to 10 keV, a set of 3D sample/sensor orientation motion actuation motors down to 1/100 deg resolution. 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).