



Energetic Neutral Particles detection in the environment of Jupiter's icy moons: Ganymede's and Europa's Neutral Imaging Experiment (GENIE)

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The detection of Energetic Neutral Particles (ENP) above 10 eV can univocally relate a surface-bound exosphere to surface features and to monitor instantaneously the effect of plasma precipitation onto the surface. The 2D imaging of plasma precipitation will provide important information on the plasma circulation at the orbits of the moons. Furthermore, a joint measurement of precipitating ions will permit an estimation the efficiency of the release process. Coupled measurements of ENP and gas composition will improve our knowledge of surface release mechanisms. GENIE (Ganymede Europa Neutral Imaging Experiment) is a high-angular-resolution detector, based on the ToF (Time of Flight) technique able to detect ENP (energy range 10 eV – few keV) in the Jupiter environment thanks to an innovative design and technology. Its objective is to map the sites of origin of the ENP of the icy moons' exospheres, to investigate the interaction between the surface and the environment. Finally, GENIE jointly with an ion-sensor and a mass spectrometer in the JUICE mission will be an outstanding opportunity to better understand also the magnetosphere-moon coupling within the Jupiter's system. In particular, a comparison between the surface interaction with the intense radiation at Europa and with the plasma shielding by the internal magnetic field at Ganymede, will provide a unique opportunity to investigate different surface evolution scenarios of Jupiter's moons.