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ENA Imaging On board the DESTINY Mission
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Energetic Neutral Atom (ENA) imaging is a technique that enables remote imaging of space plasma and neutral clouds. Several current space-borne missions including Cassini, IMAGE, TWINS, Chandrayaan-1, IBEX, and several future missions such as JUICE make use of ENA imaging to investigate magnetospheric plasma acceleration and evolution; structure and acceleration mechanisms in the boundary between the heliosphere and the interstellar medium; and surface and atmosphere interactions (terrestrial upper atmosphere, terrestrial moon, the Galilean moons, and Titan).

Demonstration and Experiment for Space Technology and INterplanetary voYage (DESTINY; See Kawakatsu et al., this conference) is an innovative technology demonstration mission that is being proposed to JAXA with a low-thrust increase of the apogee of an equatorial orbit, followed by a lunar swing-by, and finally an insertion in to a halo orbit around the Sun-Earth L2 point. This trajectory provides a historical opportunity to perform ENA imaging of the two following compelling targets.

- **The terrestrial magnetosphere:** the equatorial vantage point will offer the first compound view of how ions flow out from the polar ionospheres, , plasma stagnation at the sub-solar magnetopause, ion energization in the plasmasheet out to about 20 R_E and the subsequent heating and earthward transport that forms the terrestrial ring current.

- **The boundary between the heliosphere and the interstellar medium:** the NASA/IBEX and Cassini missions have revealed a global pattern and possibly dynamics that are believed to originate from ions charge exchanging in the heliosheath. A multitude of compelling science questions have arisen from the combined analysis of these two data sets that have demonstrated that ENA imaging is perhaps the only tool capable of remotely probing the global structure and acceleration processes in this important region.

The key to observing these targets in a new light that goes beyond previous missions is the ability to image with high angular and energy resolution, with a wide field of view (FOV) that can image large portions of the regions simultaneously. In this presentation we discuss a concept of an ENA camera to perform imaging from DESTINY. The ENA camera design is capable of imaging ENAs in the $\leq$1keV - 100 keV range with an angular resolution down to 2 degrees and an energy resolution down to 20%. The current design has a FOV of 120x90 degrees, which dramatically increases the duty cycle over single-telescope detectors on spinning platforms.