

GEO-X (GEOspace X-ray imager) : Imaging the dayside solar wind-terrestrial magnetosphere interaction

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Understanding complex nature of the solar wind interaction with solar system objects such as the Earth's magnetosphere, the Martian exosphere, and the Jovian magnetosphere is crucial in planetary physics, heliophysics and astrophysics including exoplanet physics. Remote sensing imaging observations provide global variation of these environments as a function of solar winds as demonstrated about aurora ovals, the terrestrial plasmasphere, and the terrestrial ring current. Such observations are complimentary to in-situ electromagnetic and particle observations. Recently soft X-ray emission (0.1-2.0 keV) generated via charge exchange process of high charge state solar wind ions (O6+, N5+, ...) with geocorona is discovered. Numerical simulations predict that this emission must allow us to image dayside solar wind-terrestrial magnetospheric interaction such as the magnetosheaths, the cusps and the shock. GEO-X is a Japanese small satellite mission carrying a novel wide-field of view X-ray telescope and a high speed X-ray detector to demonstrate the X-ray imaging of the Earth's magnetosphere. GEO-X aims observations of the dayside boundaries of the Earth's magnetosphere in the vicinity of the Moon around the next solar maximum.

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