

Space Science Seminar
Thursday, 2019 March 21
10:30 a.m.
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Satellite mission PhoENiX: Physics of Energetic and Non-thermal Plasmas in the X (= magnetic reconnection) Region

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Now, we are studying a new solar satellite mission, *PhoENiX*, for understanding particle acceleration during magnetic reconnection, which are ubiquitous features exhibited by a wide range of plasmas in the universe. The main observation targets of this mission are solar flares that are caused by magnetic reconnection and accelerate plasma particles. The sun is a unique target in the sense that it can be investigated in great detail with good spatial, temporal, and energy resolutions.

The scientific objectives of this mission are (1) to identify particle acceleration sites, (2) to investigate temporal evolution of particle acceleration, and (3) to characterize properties of accelerated particles, during magnetic reconnection, i.e., during solar flares. In order to achieve these science objectives, the PhoENiX satellite is planned to be equipped with three instruments of (1) Photon-counting type focusing-imaging spectrometer in soft X-rays (up to ~ 10 keV) demonstrated by FOXSI-3, (2) Photon-counting type focusing-imaging spectrometer in hard X-rays (up to ~ 30 keV) like FOXSI series, and (3) Spectropolarimeter in soft gamma-rays (spectroscopy is available in the energy range of from > 20 keV to < 600 keV; spectropolarimetry is available from > 60 keV to < 600 keV), like Hitomi/SGD. We plan to realize this satellite mission close to the next solar maximum (around 2025). In this presentation, we will explain the details of the science goals and objectives, and the instruments of PhoENiX mission. The performance of photon-counting observations in soft X-rays will also be given with the FOXSI-3 soft X-ray data.

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