

Hinode mission: its advanced performance for exploring the Sun

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"Hinode" (Solar-B) satellite was successfully launched aboard the final M-V rocket on September 23, 2006, and was finally installed into a sun-synchronous polar orbit, which allows it to observe the sun for uninterrupted periods lasting months at a time. After opening protective doors by the end of last October, the onboard instruments started their test observations for verifying their performance, followed by initial scientific observations from December. Until now, Hinode has been exploring various scientific targets including active regions, quiet sun, polar regions, and also flares. Hinode contains three instruments dedicated to observing the sun with three different wavelengths: the Solar Optical Telescope (SOT), the X-Ray Telescope (XRT),

and the EUV Imaging Spectrometer (EIS). It has been confirmed from the data that all the instruments have capability to provide unique data with high spatial resolution and excellent performance that has never been achieved by

the former spacecrafts. The primary objectives of Hinode are 1) to investigate the origin of hot plasma in the solar corona, 2) to understand the magnetic coupling between the dynamic processes occurring in the corona and the fine magnetic structures at the photosphere, and 3) to investigate the basic mechanisms involved in magnetic reconnection and other mechanisms for converting magnetic energy into thermal and kinetic energy. SOT is a medium-sized (50cm aperture) optical telescope with capability of measuring full vector magnetic fields in the photosphere and chromosphere with a spatial resolution of 0.2-0.3 arcsec (about 150km on

the sun). XRT obtains soft X-ray images of the entire Sun with angular resolution of 1 arcsec and high time cadence in tens of seconds, giving

the evolution of spatial distribution of high temperature coronal plasma in 1-10MK. EIS is a spectrograph for measuring physical conditions

and velocity fields of hot plasma in the corona and transition region. This talk will overview Hinode satellite and its instruments with emphasis of their much improved performance and show some initial results from the early observations.