

Hinode observations and researches toward the solar maximum

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Hinode has been observing the Sun for about three and half years since starting its unique observations in 2006. As a space observatory on orbit open to scientists over the world, Hinode has been leading the solar physics with wide variety of scientific discoveries. The Sun was quiet for a long period these days, which was beyond our predictions and knowledges, and the primary targets of Hinode observations in most of periods were in the quiet Sun. Hinode's observations revealed dynamical natures of the solar atmosphere even in the quiet Sun, and we have been acquiring new knowledges on the solar magnetic fields and atmosphere. One of remarkable findings is the natures at the source of slow solar winds, which are direct influence to the space weather environment around the earth. We have observed a few new active regions belonging to the new solar cycle in late 2009. In the future, Hinode observations will be primarily focused on active regions and solar flares. After the X-band transmission anomaly in early 2008, it was not easy to increase the total amount of science data from Hinode. With increased number of downlink stations and more effective data compression, Hinode is now acquiring the science data which is still very unique and effective in our scientific researches. For active regions recently appeared on the solar disk, Hinode succeeded to record the overall temporal evolution of photospheric magnetic fields for many days. In addition to this kinds of magnetic field observations, Hinode simultaneously performs imaging and spectroscopic observations of the coronal plasma, allowing us to investigate how the magnetic energy is built up and finally released as solar flares. This presentation will briefly discuss the current status of Hinode observations with some Hinode's scientific discoveries made so far and explain the baseline plan of Hinode observations toward the solar maximum.

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