[초SE-11] SUNRISE: The Mission and Selected Science Results

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The magnetic field at the surface of the Sun is concentrated in magnetic features that often have spatial extents of 100 km or less. The study of the fine scale structure of the Sun's magnetic field has been hampered by the limited spatial resolution of the available observations. This has recently changed thanks to various new high-resolution facilities, among them the SUNRISE observatory, built around the largest solar telescope to leave the ground, and containing two science instruments. SUNRISE successfully had its first long-duration science flight on a stratospheric balloon in June 2009 and a host of scientific results have been obtained from the data. After a brief introduction to the Sunrise mission, an overview of selected results obtained so far will be given. A reflight at higher solar activity is currently being prepared.

[초SE-12] Infrared Spectro-Polarimeter of the Solar Flare Telescope at NAOJ

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A new infrared spectro-polarimeter was installed in 2008 onto the Solar Flare Telescope of NAOJ in the Mitaka headquarters. The Solar Flare Telescope had been operated previously as a filter-based magnetograph and obtained vector magnetograms of active regions with the Fe I 630.3nm line during 1992 - 2005. The aim of this new instrument is to measure the distribution of magnetic helicity over the whole Sun and for an extended period with high magnetic sensitivity in the infrared wavelengths. This spectro-polarimter is able to obtain polarizations in both photospheric and chromospheric layers. In order to take full Stokes profiles, we observe Fe I 1564.8 nm and He I 1083.0 nm lines (with the neighboring photospheric Si line) for the photospheric and chromospheric magnetic field vectors, respectively. The infrared detector of this instrument is a 640×512-pixel InGaAs camera produced by a Belgian company Xenics. The frame rate of the camera is 90 frames/sec. The 640-pixel row of this camera is set along the spectrograph slit of the polarimeter. Since the slit only covers the solar hemisphere, a full disk map is obtained by raster scanning the solar disk twice. A magnetic map is made of about 1200×1200 pixels with a pixel size of 1.8 arcsec. It generally takes 1.5 hours to scan the whole Sun. Although some issues on the instrument calibration still remain, a few maps of the whole Sun at the two wavelengths are now taken daily. In this presentation, we will introduce the instrument and present some observational results.