[포ID-09] Software Design of CQUEAN

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We are developing a CCD camera named CQUEAN (Camera for Quasars in Early Universe) to search for quasars at $z > 7$. CQUEAN has a 1024*1024 deep depletion CCD chip and will be attached to 2.1m Otto-Struve Telescope at McDonald Observatory, USA. Although commercial software for the CCD camera is provided by the vendor, we are going to develop our own software to control the other instruments as well, to carry out efficient observation. There are four major parts in our software: Instrument control part controls the camera and filter wheel to obtain imaging data. Quick look window is to display acquired imaging data for quick inspection. Telescope control part interfaces with Telescope Control System (TCS) to move the telescope and to get time or coordinate information. Finally, Observation scripting facility part carries out a series of short exposures in a batch. The whole software will be written in python on linux platform, using the instrument control software libraries provided by the vendors.

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[박ID-10] Development of the Near Infrared Camera System for Astronomical Application

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In this paper, I present the domestic development of near infrared camera systems for the ground telescope and the space satellite. These systems are the first infrared instruments made for astronomical observation in Korea.

KASINICS (KASI Near Infrared Camera System) was developed to be installed on the 1.8m telescope of the Bohyunsan Optical Astronomy Observatory (BOAO) in Korea. KASINICS is equipped with a 512×512 InSb array enable *L* band observations as well as *J*, *H*, and *Ks* bands. The field-of-view of the array is 3.3′×3.3′ with a resolution of 0.39″/pixel. It employs an Offner relay optical system providing a cold stop to eliminate thermal background emission from the telescope structures. From the test observation, limiting magnitudes are *J*=17.6, *H*=17.5, *Ks*=16.1 and *L*(narrow)=10.0 mag at a signal-to-noise ratio of 10 in an integration time of 100 s.

MIRIS (Multi-purpose InfraRed Imaging System) is the main payload of the STSAT-3 in Korea. MIRIS Space Observation Camera (SOC) covers the observation wavelength from 0.9㎛ to 2.0㎛ with a wide field of view 3.67°×3.67°. The PICNIC HgCdTe detector in a cold box is cooled down below 100K by a micro Stirling cooler of which cooling capacity is 220mW at 77K. MIRIS SOC adopts passive cooling technique to chill the telescope below 200K by pointing to the deep space (3K). The cooling mechanism employs a radiator, a Winston cone baffle, a thermal shield, MLI of 30 layers, and GFRP pipe support in the system. Opto-mechanical analysis was made in order to estimate and compensate possible stresses from the thermal contraction of mounting parts at cryogenic temperatures. Finite Element Analysis (FEA) of mechanical structure was also conducted to ensure safety and stability in launching environments and in orbit. MIRIS SOC will mainly perform the Galactic plane survey with narrow band filters (Pa α and Pa α continuum) and CIB (Cosmic Infrared Background) observation with wide band filters (*I* and *H*) driven by a cryogenic stepping motor.