[구AT-05] Preliminary Design of the NISS onboard NEXTSat-1

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The NISS (Near-infrared Imaging Spectrometer for Star formation history) onboard NEXTSat-1 is the near-infrared instrument onboard NEXTSat-1 which is being developed by KASI. The main scientific targets are nearby galaxies, galaxy clusters, star-forming regions and low background regions in order to study the cosmic star formation history in local and distant universe.

After the Preliminary Design Review, we have fixed major specifications of the NISS. The off-axis optical design with 15cm apertureis optimized to obtain a wide field of view (2 deg. x 2 deg.), while minimizing the sensitivity loss. The opto-mechanical structure of the NISS was designed to be safe enough to endure in the launching condition as well as the space environment. The tolerance analysis was performed to cover the wide wavelength range from 0.95 to 3.8μm and to reduce the degradation of optical performance due to thermal variation at the target temperature, 200K. The 1k × 1k infrared sensor is operated in the dewar at 80K stage. We confirmed that the NISS can be cooled down to below 200K in the nominal orbit through a radiative cooling. Here, we report the preliminary design of the NISS.