as neutron stars or black holes. I will introduce the state-of-the-art X-ray microcalorimeters being developed at NASA/GSFC and the future X-ray observatory missions based on microcalorimeters.

[구 AT-08] Amplitude Correction Factors of KVN Observations Correlated by DiFX and Daejeon Correlators

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We report results of investigation of amplitude calibration for very long baseline interferometry (VLBI) observations with Korean VLBI Network (KVN). Amplitude correction factors are estimated based on comparison of KVN observations at 22 GHz correlated by Daejeon hardware correlator and DiFX software correlator in Korea Astronomy and Space Science Institue (KASI) with Very Long Baseline Array (VLBA) observations at 22 GHz by DiFX software correlator in National Radio Astronomy Observatory (NRAO). We used the observations for compact radio sources, 3C 454.3 and NRAO 512 which are almost unresolved for baselines in a range of 350-477 km. VLBA visibility data of the sources observed with similar baselines as KVN are selected, fringe-fitted, calibrated, and compared in their amplitudes. We found that visibility amplitudes of KVN observations should be corrected by factors of 1.14 and 1.40 when correlated by DiFX and Daejeon correlators, respectively. These correction factors are attributed to the combination of two steps of 2-bit quantization in KVN observing systems and characteristics of Daejeon correlator.

[구 AT-09] VLBI Phase Referencing and Astrometry with KVN and KaVA

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Phase referencing is an important tool to study weak radio sources, especially in mm-VLBI (Very Long Baseline Interferometry) which are usually too faint to be observed using conventional VLBI. VLBI astrometry is a unique method to measure the position and to identify radio emitting regions of a radio source with unprecedented angular resolution. In order to evaluate the phase referencing and astrometric capabilities of KVN and KaVA, several observations have been conducted and analyzed. I will present the observational results and discuss constraints and requirements for high precision VLBI astrometry.

[구 AT-10] Near-Infrared Imaging Spectroscopic Survey in Space

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To probe the star formation in local and early Universe, the NISS with a capability of imaging spectroscopy in the near-infrared is being developed by KASI. The main scientific targets are nearby galaxies, galaxy clusters, star-forming regions and low background regions. The off-axis optical design of the NISS with 15cm aperture was optimized to obtain a wide field of view (FoV) of 2 deg. × 2 deg. as well as a wide spectral coverage from 0.9 to 3.8μm. The opto-mechanical structure was designed to be safe enough to endure in both the launching condition and the space environment. The dewar will operate 1k × 1k infrared sensor at 80K stage. The NISS will be launched in 2017 and explore the large areal near-infrared sky up to 200 deg.^{2} in order to get both spatial and spectral information for astronomical objects.

As an extension of the NISS, KASI is planning to participate in a new small space mission together with NASA. The promising candidate, SPHEREx (Spectro-Photometer for the History of the Universe Epoch of Reionization, and Ices Explorer) is an all-sky survey satellite designed to reveal the origin of the Universe and water in the planetary systems and to explore the evolution of galaxies. Though the survey concept is similar to that of the NISS, the SPHEREx will perform the first near-infrared all-sky imaging spectroscopic survey with the wider spectral range from 0.7 to 5μm and the wider FoV of 3.5 deg. × 7 deg.

Here, we report the current status of the NISS and introduce new mission for the near-infrared imaging spectroscopic survey.