[ID-04] 100-GHz test observations of the KVN Antennas

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Korean VLBI Network, KASI

Three KVN antennas have been constructed by American company Antedo in collaboration with its domestic counterpart High Gain Antenna. The antennas are expected to have pointing accuracies of 4˝ and aperture efficiencies of 60% at 100 GHz. We have carried out 100GHz test observations with KVN antennas in order to investigate whether their performances satisfy the requirements. In this talk we will present the results.

■ Session : 기기/자료처리 II (ID)
4월 29일(수) 16:25 ~ 17:25 제4발표장

[ID-05] Single-dish test observations of the KVN Yonsei telescope at 22/43GHz

Sang-Sung Lee, Do-Young Byun, Do-Heung Je, Seog-Tae Han, Kee-Tae Kim, Bong Won Sohn, Hyunsoo Chung, Se-Hyung Cho, Se-Jin Oh, Duk-Gyoo Roh, Chang Hoon Lee, Bong Gyu Kim

Korean VLBI Network, KASI

We have carried out 22/43-GHz single-dish test observations of the KVN Yonsei telescope, which was firstly equipped with 22/43GHz receivers among the KVN telescopes. We measured its pointing accuracy and aperture efficiencies. We also investigated how well 22/43-GHz beams are aligned and performed phase stability tests. The pointing accuracy is < 5 arcsec RMS and the estimated efficiencies are 64%-68%. The 22/43-GHz beams are aligned within 5 arcsec.

[ID-06] 초고속 대용량 자료 저장 시스템 구축

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한일공동VLBI상관기(Korea-Japan Joint VLBI Correlator, KJJVC) 는 초당 최대 1.4기가바이트의 속도로 상관 처리 자료를 출력하는 초고속 계산기이다. 초당 최대 1.4기가바이트에 이르는 상관 처리 결과를 저장 처리할 수 있는 대용량 자료 저장 장치를 구성하기 위하여, 10GbE 광케이블 4회선을 통하여 상관자료를 입력 받고, 동일한 저장 공간에 적절한 크기의 파일들로 동시에 고속으로 저장될 수 있도록 설계하였다. 2009년 1월 완성된 초고속 대용량 자료저장 시스템(Peta-scale Epoch Data Archive

(PEDA) system)은, 현재 KJJVC의 세계 최고속의 전파 자료 전송 능력(1.4Gigabytes/sec)과 119테라바이트의 실 저장용량을 갖추고 있다. PEDA 시스템은 전체 한일공동VLBI상관기의 한 부분이며, KVN, 한일공동 VLBI 네트워크에 중요 장비로 사용될 예정이다. 이 시스템의 구성과 특징 등을 소개하고자 한다.

[ID-07] Simulation of sources distribution for KVN Calibrator Survey (KVNCS)

Lee, Jeong Ae[1,2], and Sohn, Bong-Won[1]

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In order to observe weak radio sources with VLBI, their visibility phase should be corrected via the visibility phase of the nearby calibrators. For that, we need the phase reference sources. We have carried out the calibrator candidate selection to prepare the KVN Calibrator Survey (KVNCS). Prior to observation, we studied the source distribution at higher than -30° of declination. Our study were based on the VCS (VLBA Calibrator Survey) catalogue. Using 3799 sources from VCS, we estimated the expected flux of K and Q bands and selected sources which have flux stronger than 100mJy. First, we confirmed the spatial distribution of the calibrator candidates so that we found out how many sources we have to detect in the future. When we performed the phase-referencing observation, in general, a separation angle between target source and calibrator should be 2° to 5°. Using Delauney Triangulation technique to calculate the effective area of each source, we compared with the area of spherical triangles. Through this calculation, we are able to confirm the region where we have to find more calibrators. We will carry out a test run on the sample of the candidates to verify and to monitor their flux in the first half of 2009.

[ID-08] First fringe detection, sensitivity estimation and operation mode of KVN

Bong Won Sohn[1], Atsushi Miyazaki[2], Do-Young Byun[1], Hideyuki Kobayashi[2], Do Heung Je[1], Yukitoshi Kanya[3,1], Tomoharu Kurayama[1], Sang Sung Lee[1], Tae Hyun Jung[4,1] and KVN & VERA team

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[3]*Yonsei University,* [4]*University of Science and Technology*

We report the result of the KVN-VERA fringe detection. The experiments were carried out on 1st and 3rd November 2008. Further tests are done on 12th and 13th of March 2009. KVN Yonsei telescope and all available VERA telescopes participated in the observations. Strong water

maser sources, W49N and Ori-KL and radio loud AGNs, NRAO150 and J2148+0657, were observed at K-band. In March 2009 two strong SiO maser sources, IK Tau and R Leo, were observed as well. For all observed sources in 2008, we detected the fringes at all baselines. Further tests are planned for K/Q band fringe detection and image sensitivity experiments in 2009. The scientific operation plan and the possible operation mode of KVN will be discussed also. In this talk, we introduce East Asian VLBI array where KVN will play important role. Especially EAVN observation at 22 and 43GHz is our interest. Sub mJy level imaging sensitivity which is comparable to NRAO FIRST survey sensitivity will be feasible with milli-arcsend resolution. The scientific cases of AGN evolution will be discussed briefly.

■ Session : 은하/우주론 IV (GC)
4월 30일(목) 09:00 - 10:45 제1발표장

[GC-18] CEOU: Center for the Exploration of the Origin of the Universe
Myungshin Im

Center for the Exploration of the Origin of the Universe (CEOU), Astronomy Program, Department of Physics & Astronomy, Seoul National University

We introduce research projects being carried out at CEOU (Center for the Exploration of the Origin of the Universe) at Seoul National University. CEOU is one of Creative Research Initiatives research centers, which started its operation in June 2008 as a 9-year project. The main focus of the CEOU is a NIR Intermediate-wide, Medium-deep survey which aims to cover ~150 square degree of the sky to the depth of 23 AB magnitude in J-band. The survey will be carried out using the United Kingdom Infrared Telescope (UKIRT) and a 2-m class equipped with a mosaic camera with deep depletion CCD chips which we are now developing. The main objectives of the survey are to discover and study (1) the first quasars in the universe at z > 7; and (2) the first massive galaxy clusters at 1 < z < 2. Our study, however, will not be limited to these surveys. We are also carrying out various projects to understand the nature of distant galaxies and the growth of supermassive blackholes in quasars, including overdensity at high redshift, galaxy property and evolution near and far, and two programs related to quasars such as SNUQSO (Seoul National University Bright Quasar Survey), and QSONG, a NIR spectroscopy study of quasars.

[GC-19] Y-band Imaging of Extragalactic fields and High Redshift Quasars
Changsu Choi, and Myungshin Im

Center for the Exploration of the Origin of the Universe, Astronomy Program, Department of Physics and Astronomy, Seoul National University

We carried out the observations of several extragalactic fields, brown dwarfs, high-z QSO and A0V standard star imaging with Y-band filter at the Mt. Lemmon Optical Astronomy Observatory (LOAO) and the Maidanak Observatory. The deepest limit magnitude of 260 minutes exposure is Y = 21.5 AB mag in case of LOAO and Y = 22 AB mag for the Maidanak Observatory. Using the Y-band imaging data, we measured photometric calibration parameters of Y-band. We got two photometric calibration parameters atmospheric extinction coefficient k = 0.087 and zero point ξ = 18.29 in LOAO , k = 0.1 and zero point ξ = 19.14 mag in Maidanak Observatory. We performed number counts in Y-band imaging fields and found slopes consistent with previous I-band and J-band data. Also, we tested the usefulness of high redshift QSO (z > 6) selection via i-z VS z-Y color-color diagram. The discrimination method between them with i-z va z-Y color-color diagram shows that it is as effective as the i-Y vs Y-J color-color diagram method which means we can search high redshift QSOs effectively with an optical CCD installed at 1m class telescopes. Furthermore we analyzed characteristics of Y-band objects with color-magnitude diagram and redshift - Y-band magnitude relation.

[GC-20] KASINICS J-band Imaging of High Redshift Quasar Candidates
Won-Kee Park, Myungshin Im, Induk Lee, Hyunjin Shim, Eugene Kang

Department of Physics and Astronomy/CEOU, Seoul National University

We report the current status of search for high redshift quasars using KASINICS Near-IR imaging data. We have been searching for z ~ 6 quasar candidates from high galactic latitude region of the Sloan Digital Sky Survey (SDSS) SEGUE dataset which covers about 3500 square degree area in the sky. So far, we have selected 91 i-band dropout objects (i-z > 2.3 mag) from the SDSS SEGUE data. In order to select the best high redshift quasar candidates, we obtained J-band images of 30 candidates using KASINICS NIR camera on the Bohyunsan Optical Astronomy Observatory (BOAO) 1.8m telescope. The (i-z) vs (z-J) color-color diagram of observed targets identifies a few possible distant quasars. Photometric observation of more targets are being carried out, and spectroscopic observation of reliable targets are planned. Our observation demonstrates that it is feasible to select distant quasar