

VERA System and Recent Results

*H. Kobayashi*¹, *S. Manabe*¹, *N. Kawaguchi*¹, *K.-M. Shibata*¹, *Y. Tamura*¹,
*O. Kameya*¹, *M. Honma*¹, *T. Hirota*¹, *H. Imai*², *T. Omodaka*²

¹) *VERA Observatory, National Astronomical Observatory of Japan*

²) *Department of Science, Kagoshima University*

Contact author: H. Kobayashi, e-mail: hideyuki.kobayashi@nao.ac.jp

Abstract

VERA is the first VLBI array, which is designed to be free from atmosphere phase fluctuations. It has four VLBI stations with 2,300 km maximum baseline length within the Japan archipelago. The observing frequencies are 2, 8, 22, and 43 GHz. 22 and 43 GHz frequencies are mainly used for H₂O and SiO maser object observations, respectively. And 2 and 8 GHz bands are mainly used for geodetic observations. VERA uses a 1 Gbps recording system with cassette magnetic tapes. They are correlated by the VSOP correlator at Mitaka. VERA performs astrometry observations with 10 micro-arc-second accuracy to detect annual parallaxes around the galaxy. In order to achieve such high accuracy, the VLBI technique has to be used with phase referencing techniques. To compensate for phase fluctuations of interferometer visibilities, which are mainly caused by the atmospheric turbulences and phase drifts of local oscillators, VERA antennas have a two-receiver system which makes simultaneous observations of two objects. By comparing the visibility phase between these two objects, simultaneous phase referencing VLBI is achieved. Usually a galactic maser object is selected as a target and an extra galactic object is selected as a reference source. The talk presents the status of VERA and some results.

[Note from the Editors: The overheads of the oral presentation of this contribution can be downloaded from the IVS 2006 General Meeting web site. Please get the PDF file of the presentation at the URL ftp://ivscc.gsfc.nasa.gov/pub/general-meeting/2006/presentations/gm2006_1-14_kobayashi.pdf.]