

The 6 m mm-VLBI telescope at Kagoshima, Japan

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VLBI observations of millimeter wavelengths can probe the broad line emission and jet forming regions of quasars, and the scale of an accretion disk around massive black holes in nearby active galaxies, which are self-absorbed at longer wavelengths. Therefore, the extension of the mm-VLBI network is timely and urgent problem. We are now planning to move Nobeyama 6 m mm VLBI telescope to Kagoshima. The telescope will be placed at Kinkohwan park in Kagoshima City in late 1992 and will be operated in 1993. The frequencies for VLBI observations will range from 22 GHz to 100 GHz.

To date, there are two mm-VLBI facilities in Japan: Nobeyama 45 m and Kashima 34 m, However, the longest baseline is only about 200km EW which provides a fringe separation of 17 mas. This is not sufficient for high resolution mapping. A 10 m telescope which is under construction at Mizusawa, 400 km north from Kashima which will be usable up to 43 GHz and will add a north-south baseline, which is very important for astrometric measurement. Figure 1 shows an overview of the mm-VLBI telescope's locations in Japan.

To join the 6 m telescope into this domestic VLBI network is very attractive. We can get longer baseline and better u-v coverage because Kagoshima is located at the southern tip of the Kyushu Island and is very far away from other telescopes

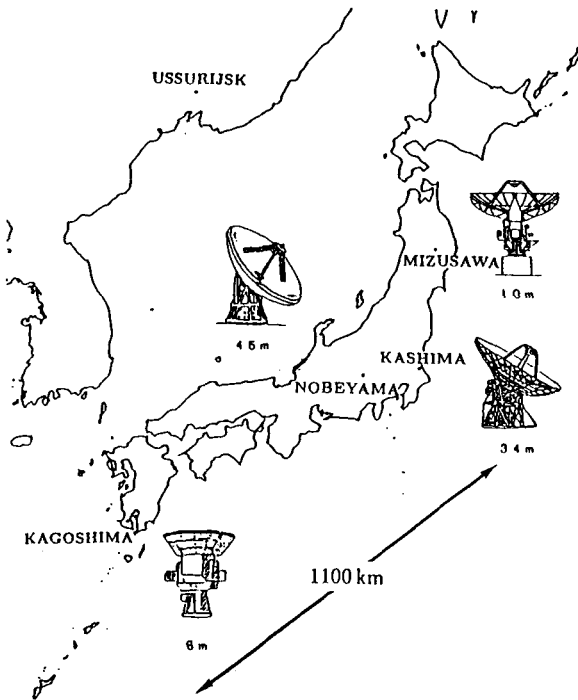


Fig. 1. mm-VLBI Facilities in JAPAN

which are the 45 m and 34 m. The resolution of half milliarc-second on the mm-wave region is obtained by the domestic VLBI network if 6 m telescope is included.

Owing to the limitations of antennas, receivers, local oscillators, and - compared to cm-VLBI observations - a stronger influence of the atmosphere (electrical path length fluctuations), mm-VLBI observations require substantial technical efforts than those for cm-VLBI. Kawaguchi¹ proposed an idea of a burst sampling VLBI observation for defeating the coherence limit by atmospheric disturbance. The trial production

of the burst sampling system is under way and a first attempt of a millimeter VLBI observations by the 6 m telescope with this system will be made in 1993. Also we are now making another sampling system with a bandwidth synthesizer using a high speed sampler and filters instead of video converters. Further, we are now planning to construct a new clock system using the time base from a satellite clock instead of a hydrogen maser. A VLBI Space Observatory Programme (VSOP) satellite will be launched in 1995 from Uchinoura. The 6 m telescope in collaboration with domestic telescope and VSOP enables high-resolution observations of celestial objects such as quasars or compact stellar sources.

Reference

1. Kawaguchi, N.: 1991, *FRONTIERS OF VLBI*, eds. H. Hirabayashi, M. Inoue and H. Kobayashi, Universal Academy Press, Tokyo, Japan, p. 269.