

DESIGN OF CHINESE SECOND 25-m VLBI ANTENNA

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The first Chinese 25-m VLBI antenna has just been completed at the She-Shan Station of the Shanghai Observatory. In accordance with the plan of the Chinese VLBI Network, the second 25-m VLBI antenna will be established at the Urumqi VLBI Station. It is a shaped symmetric dual reflector Cassegrain antenna and will be equipped with nine feeds from 0.3 GHz to 23 GHz. The surface accuracy of the main reflector is 0.65 mm, and the 14-m central part has a better surface accuracy (0.42 mm) to provide the possibility of making VLBI observations at 44 GHz. This antenna has a semihomology design, and its subreflector has a mechanism to focus it in three dimensions. Crossed dipole feeds for the 0.32 and 0.61 GHz bands are located in the middle of the subreflector, and the focussing mechanism will retract it to bring the dipoles to the prime focus. For other frequencies, a corrugated horn will be mounted at the Cassegrain focus. To obtain dual frequency operation at X and S bands, a flat dichroic reflector and an elliptical reflector will be mounted over the on-axis S band horn and off-axis X band horn, respectively. The antenna has a wheel and track mounting, and the pointing will be controlled by an IBM PC/XT microcomputer. The pointing and tracking accuracy is 16 arcsecond. The estimated aperture efficiencies are in the range of 45–65%. The estimated antenna temperatures are in the range of 35–100 K.