

ASTROMETRIC AND GEODETIC GOALS FOR THE CHINESE VLBI NETWORK PROJECT

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ABSTRACT. This paper briefly introduces the current status of the Chinese VLBI Network (CVN) Project and its astrometric and geodetic goals.

1. Current Status of CVN Project

At present, the CVN project consists of three dedicated VLBI stations, two part-time VLBI stations, and a data analysis center. More information about the progress of the CVN project is as follows:

1.1 VLBI Stations

| (1) Sites | | | | |
|-----------|---------------------------------------------------|----------------|-----------------|------------------|
| Code | Station | Antenna (m) | Lat. N (°,') | Long. E (°,') |
| SH | Sheshan Radio Astronomy Station | 25 | 31 06 | 121 12 |
| UR | Urumqi Radio Astronomy Station | 25 | 43 30 | 87 13 |
| KM | Kunming Radio Astronomy Station | 32 | 25 01 | 102 47 |
| MY | Miyun M-wave Synthesis Radio Astronomy Station | 47 (equiv.) | 40 40 | 117 58 |
| QH | Qinghai Mm-wave Radio Astronomy Station | 13.7 | 37 21 | 97 36 |

| (2) Equipment | | | | | | |
|----------------------------|-------------------|-----------|----|----|-----------|----|
| Items | Station | Dedicated | | | Part-Time | |
| | | SH | UR | KM | MY | QH |
| Antenna | | † | + | - | † | † |
| Receivers | 330-MHz | † | + | - | + | |
| | 610-MHz | + | + | - | | |
| | 1.4-GHz | † | + | - | | |
| | 1.6-GHz | † | + | - | | |
| | 2.3-GHz | † | + | - | | |
| | 4.9-GHz | † | + | - | | |
| | 8.4-GHz | † | + | - | | |
| | 10.7-GHz | † | + | - | | |
| | 12.2-GHz | † | + | - | | |
| | 22.2-GHz | - | - | - | | † |
| Data Acquisition Terminals | Mk II | † | † | † | + | + |
| | Mk III or VLBA | † | - | - | | - |
| Frequency Standards | H maser | † | + | + | | - |
| | Rb | † | † | † | - | |
| Timing Receivers | Loran-C | † | † | † | | |
| | GPS | † | + | - | - | - |
| Operation Start | | 87 | 92 | 94 | 92 | 92 |

Codes: † Available; + Fabrication started or ordered; - Planned.

1.2 VLBI Data Analysis Center

The data analysis center of CVN is located at Shanghai and operated by Shanghai Observatory, Chinese Academy of Sciences. The main facilities in the VLBI data analysis center are as follows:

| Facilities | Available | Remark |
|----------------------------|-----------|----------------------------------------------------------------------------------------------------------------------|
| VLBI Correlator: S-2 | 1988 | Compatible with Mk II |
| S-3 | 1993/94 | Compatible with Mk III and VLBA |
| Computer: HP-1000 F series | 1985 | For the data analysis of astrometric and geodetic VLBI Mk III experiments. |
| MicroVAX II | 1988 | For the postprocessing of the data from S-2 correlator and the data analysis of continuum and line VLBI experiments. |
| VAX 3800 | 1991 | VLBI data analysis |
| Sun 4/11 | 1991 | VLBI data analysis |

2. Astrometric and Geodetic Goals for the CVN Project

- To measure the positions of the extragalactic compact radio sources (one source/ $5^\circ \times 5^\circ$; declination: -30° to $+90^\circ$) for the establishment of the radio reference system;
- To monitor the structure variations and the proper motions of the radio sources for the maintenance of the radio reference system;
- To measure the positions and proper motions of radio stars and cosmic masers associated with late-type stars for the linkage between the radio and optical reference systems;
- To measure the positions and proper motions of the pulsars combining the pulsar-timing data for the determination of the equinox;
- To measure the Earth rotation parameters;
- To measure the positions of the CVN stations with mm accuracy combining the Chinese SLR and GPS networks for the establishment of the Chinese Crustal Deformation Monitoring Network (CCDMN) and the global terrestrial reference system;
- To measure the crustal motions between the eastern, north-western, and south-western regions of China;
- To measure the relative motions between the Chinese continent and the surrounding plates, e.g., Pacific, North American, Australian, Indian, and Philippine plates and to monitor the stability of the Eurasian plate;
- To control the orientation and scale of the Chinese National Geodetic Control Network.