

Fortaleza Station Report for 2002

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Abstract

This is a brief report on the activities carried on at Fortaleza geodetic VLBI Station (ROEN: Rádio Observatório Espacial do Nordeste), Eusébio, CE, Brazil, in 2002, consisting mainly of 50 VLBI observing sessions and continuous GPS monitoring recordings.

1. Introduction

The Rádio Observatório Espacial do Nordeste, ROEN, located at INPE facilities in Eusébio, nearly 30 km east from Fortaleza, Ceará State, Brazil, began operations in 1993. Geodetic VLBI and GPS observations are carried out regularly, as contributions to international programs and networks. ROEN is part of the Brazilian space geodesy program which was carried out by CRAAE, the Center for Radio Astronomy and Space Applications (a consortium between Brazilian institutions Mackenzie, INPE, USP and UNICAMP). Construction and activities at ROEN were sponsored at the beginning by U.S. agency NOAA and Brazilian Ministry of Science and Technology's FINEP agency. Presently the operational staff and part of the infra-structure is maintained by INPE and by Mackenzie; the other costs of technical maintenance, and part of the infra-structure, are sponsored by US agencies NASA, USNO and NOAA.



Figure 1. Main building and 14.2m antenna of Fortaleza Station

2. Brief Description of ROEN Facilities

The largest instrument of ROEN is the 14.2 m radio telescope, on one alt-azimuth positioner. It is operated at S- and X-bands, using cryogenic radiometers. The system is controlled by Field System, Version 9.5.3 program. Observations are recorded with a Mark III data acquisition system. One Sigma-Tau hydrogen maser clock standard is operated at ROEN.

GPS monitoring is performed by one dual frequency GPS Rogue receiver operated continuously. The collected data are provided to the IGS center, as well to Brazilian IBGE center. ROEN has all basic infra-structure for mechanical, electrical and electronic maintenance of the facilities.

3. Space Geodesy Team

The Brazilian space geodesy program is coordinated by Prof. Pierre Kaufmann, from São Paulo main office at CRAAM(CRAAE)/Instituto and Universidade Presbiteriana Mackenzie, receiving scientific assistance from Dr. Claudio E. Tateyama, and partial administrative support from Valdomiro S. Pereira and Neide Gea. Partial technical assistance is given by Itapetinga Radio Observatory staff, near São Paulo, also operated by INPE/Mackenzie.

The Fortaleza Station facilities and geodetic VLBI and GPS operations are managed in site by Eng. A. M. P. de Lucena (CRAAE/INPE), assisted by Eng. Adeildo Sombra da Silva (CRAAE/Mackenzie), and technician Avicena Filho (CRAAE/INPE). Local administrative support was given by Desirée Aguiar de Lima.

4. Geodetic VLBI Observation

Fortaleza participated in following geodetic VLBI experiments, as detailed in the table below for the year 2002.

Experiment	Number of Sessions
IVS-R4	37
IVS-T2	03
IVS-CRF	04
IVS-OHIG	06

5. Development and Maintenance Activities in 2002

Considerable attention was given to technical maintenance problems, specially to the following ones:

1. Tests and mechanical alignment of the antenna elevation axis motors and gears.
2. Up-dating and tests for new versions of Field System.
3. Repair on cryogenic system with replacement of dewar.
4. Replacement of S and X-band feed and receivers adjustment.
5. Repairs on the following circuits, modules, or systems: Mark III video converters, Mark III power supplies, Mark III IF3 module, and the receivers monitoring subsystem.
6. Maintenance of web site (<http://www.roen.inpe.br>).

6. GPS Operation

The IGS network GPS receiver operated regularly at all times during 2002. Data were collected and uploaded to IGS/NOAA computer.

7. Scientific Papers

1. TATEYAMA, C. E.; KINGHAM, K. A.; KAUFMANN, P.; LUCENA, A. M. P. de; “Observations of 1803+784 from the geodetic VLBI archive of the Washington correlator”, *Astrophys. J.*, 573:496-504, July 2002.