Fortaleza Station Report for 2001

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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 2001, consisting mainly of 72 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. The 14.2-m antenna located in Eusébio near Fortaleza

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 9.5.0 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 technicians Avicena Filho (CRAAE/INPE) and Clairvânia Maria Anastácio da Silva (CRAAE,Mackenzie). Local administrative support was given by Natalia Duarte.

4. Geodetic VLBI Observation

Fortaleza participated in following geodetic VLBI experiments, as detailed in the table below for the year 2001.

Experiment	Number of Sessions
NEOS-A	52
IRIS-S	12
CORE	07
CRF	01

5. Development and Maintenance Activities in 2001

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

1. Verification of mechanical alignment of the antenna elevation axis motors and gears.
2. Installation and tests of the version 9.5.0 of Field System.
3. Installation of a new e-mail and DNS server in the Fortaleza local network.
4. Replacement of the helium compressor of the cryogenic system.
5. Repairs on the following circuits, modules, or systems: Mark III video converters, Mark III power supply, Mark III IF3 module, HPA of antenna drives, DC motor of elevation axis, tachometer, noise calibration diodes controller, the controller of motor-generator group, and the cryogenic system.
6. Maintenance of web site (http://www.roen.inpe.br).

6. GPS Operation

The IGS network GPS receiver operated regularly at all times during 2001. Data were collected and uploaded to IGS/NOAA computer.

7. Scientific Papers

1. TATEYAMA, C. E.; KAUFMANN, P.; KINGHAM, K. A.; LUCENA, A. M. P. de; "Observações de VLBI (Interferometria de Linha de Base Muito Longa) de 8 GHz de 1803+784". in: XXVII Reunião Anual da SAB, Agosto de 2001.
2. 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", Submitted to ApJ, 2001.