

Hobart, Mt. Pleasant, Station Report for 2004

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Abstract

This is a brief report on the activities carried out at the Mt. Pleasant Radio Astronomy Observatory at Hobart, Tasmania. During 2004, the Observatory participated in 44 VLBI observing sessions with IVS.

1. Introduction

The Mt. Pleasant Observatory is located about 15 km north east of Hobart at longitude 147.5 degrees East and latitude 43 degrees South. The station is operated by the School of Mathematics and Physics at the University of Tasmania with financial support from the University and with the aid of an Australian Research Council (ARC) Linkage grant in conjunction with Geoscience Australia. The station has participated in geodetic VLBI programs since 1988 but only joined IVS in 2002 when we were able to secure funding support for geodetic observations for a five year period. The station has a co-located GPS receiver and a site which is used for absolute gravity measurements.

2. Brief Description of VLBI Facilities

The antenna is a 26m prime focus instrument with an X-Y mount. The focus cabin has recently been upgraded to include a feed translator with provision for four different receiver packages which enables rapid change over between geodetic and astronomical requirements. Standard receiver packages provide for operation at L band, S, C, X and K bands. There is also the dual frequency S/X geodetic receiver. All of these receivers are cryogenically cooled. The antenna has a maximum slew rate of 40 degrees per minute about each axis. The station is equipped with a Mark IV electronics rack and a Mark 5 VLBI recording system as well as S2 recorder. There is also another disk based recording system as used by other Australian VLBI antennas.

3. Staff

Staff at the observatory consisted of academics, Prof. John Dickey (director), Dr. Simon Ellingsen, Dr. Melanie Johnston-Hollitt and Prof. Peter McCulloch who has had a large input into the receiver design and implementation. Dr Giuseppe Cimó is a research fellow and has input into the Linux systems at the observatory. Mr. Brett Reid is the Observatory Manager whose position is funded by the university. In addition we have an electronics technical officer, Mr. Eric Baynes funded through the ARC grant and a half time mechanical technical officer. Mr Barry Wilson retired from the technical officer (mechanical) position and has been replaced by Mr. Geoff Tonta. For operation of the observatory during geodetic observations we rely heavily on support from astronomy PhD and post-graduate students.



Figure 1. The Mt Pleasant 26m antenna

4. Geodetic VLBI Observations

Hobart participated in 44 geodetic VLBI experiments during 2004. These were divided between the R1, OHIG, SYOWA, CRF, CRDS, T2, and APSG programs. All experiments, except SYOWA, were recorded using Mark 5. During some astronomy observations, formatter problems recording at the higher data rate of 512 Kb/s were discovered. Data from a few IVS experiments could not be correlated while repairs for bad synch and missing tracks were made to the formatter at Hobart. Our thanks go to the Haystack staff for advice on how to perform repairs to fix the formatter problems. A photogrammetry survey of the dish surface was performed in 2004. This survey was commissioned by Geoscience Australia and was looking particularly at gravitational distortions of the antenna.

5. Future Plans

As a part of the (ARC) linkage funding, we plan to have a PhD student in geodetic VLBI. The station's existing humidity, temperature and pressure sensors will be replaced in early 2005 by a more accurate MET3 sensor funded by NAOJ. This instrument has arrived and is installed and requires only the final implementation. Funding has been secured under ARC LEIF (Large Equipment and Infrastructure Funding) for a 10 Gb/s fibre optic link between the Mt. Pleasant VLBI site and the university campus to be installed by the end of 2005.