

Hobart, Mt. Pleasant, Station Report for 2006

Brett Reid, John M. Dickey

Abstract

This is a brief report on the activities carried out at the Mt. Pleasant Radio Astronomy Observatory at Hobart, Tasmania. During 2006, the Observatory participated in 44 VLBI observing sessions with IVS, 24 hours each.

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. Hobart is the capital city of Tasmania, the island state of Australia located to the south of the mainland. 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 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 and Dr Jamie Stevens are research fellows and have had input into the Linux systems at the observatory. Jamie is also working on the fiber optic link to Mount Pleasant which is now due for commissioning by March 2007. 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, and a half time mechanical technical officer, 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 2006. These were divided between the R1, CRDS, OHIG, RDV, T2, CRF, R4 and APSG programs. All experiments were recorded using Mark 5A. The antenna was down for a month during May for a scheduled upgrade of the drive motors and controllers. The SCR DC drives were changed for AC vector drives. The antenna drives have proven far more reliable since the upgrade. The motors and controllers were bought using an equipment grant from University of Tasmania in 2005. The observatory staff performed the installation and commissioning of the new drives.

5. Future Plans

In 2007, Hobart is increasing its support to IVS by participating in 60 24-hour experiments, an increase of 36% above those performed in 2006.

The ARC LEIF (Large Equipment and Infrastructure Funding) funded 10 Gb/s fibre optic link between the Mt. Pleasant VLBI site and the university campus is expected to be complete by March 2007.

The 2006 equipment money from the university was used to purchase vacuum/cryogenic parts to enable vacuuming of the cryogenic dewars remotely, decreasing downtime for the antenna. We hope to install the remote vacuum system in the first half of 2007.

In 2006 the Australian geodetic community made a strong case for expanding the VLBI re-

search infrastructure available for IVS. The recently announced National Cooperative Research Infrastructure Scheme includes funds for building three new 12m telescopes, to be dedicated to IVS observations for approximately 50% of the time. This five year project will vastly improve the capabilities of the IVS in the southern hemisphere. Funding from the Australian Department of Education, Science, and Training is expected starting later in 2007.