



The Impact of Gravitational Sag on VLBI Results of the Hobart, Mt. Pleasant Radio Observatory

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The structural deformation of radio telescopes as a consequence of gravitational sag can vary the distance between the radio telescope's reference point and the receiver as a function of the telescope's elevation (and in some cases azimuth). Un-modelled gravitational sag will make a contribution to inter-technique coordinate biases detected through multi-technique (i.e. VLBI to GPS, SLR, DORIS) combinations. In August 2004 the X/Y type Hobart, Mount Pleasant radio telescope, located in Tasmania, Australia, was surveyed by conventional survey techniques so as to enable the recomputation of the local tie between the radio telescope, used for VLBI, and the IGS geodetic GPS antenna located nearby. In addition to these observations, further conventional survey observations and a precision terrestrial photogrammetry survey were undertaken in attempt to quantify the gravitational sag of the radio telescope. It was determined that, as a function of the telescope's pointing elevation and azimuth, the distance between the telescope receiver and the reference point varied by approximately 2 mm. A gravitational sag model for the Hobart telescope is developed and an assessment of its impact on geodetic VLBI is made.