

Annual report 1999-2000.75

to the NKG Working Group for Geodynamics

Chalmers, Onsala Space Observatory

Geodynamics

Onsala Space Observatory is engaged in using Continuous GPS to observe the postglacial rebound of Fennoscandia. The system builds on joint efforts in the Nordic countries during most of the 1990'ies to create, furnish and maintain highly stable satellite observation facilities with permanent monuments.

We emphasis all-weather systems based on microwaves for distance, positioning and timing/ranging measurement. We develop measurement techniques for the reduction of systematic errors, and consider especially the atmosphere.

For solid earth applications and relations to sea level, the BIFROST project's objectives are to produce station velocity results and attribute studies of deformation in all three spatial components. Active in BIFROST is an international group of geodesists and geophysicists from Nordic countries US and Canada. This year the BIFROST project has strengthened its ties to WEGENER.

Onsala has been participating in European and world-wide VLBI experiments for crustal deformation and Earth rotation (EURO, CORE-B, RDV). We are involved as a Special Analysis Center, as a Network Station, and as a Technical Development Center in the recently created International VLBI Service (IVS). We have responsibility for a special study group on geophysical models in VLBI software.

We have investigated the impact of ocean tide loading-induced site displacements on estimation of earth orientation parameters in sparse VLBI networks. GPS point-positioning has been used to study residual motion and compare with predicted loading effects.

We host an informal service for ocean tide loading parameters used in GPS, SLR and VLBI analysis programs. Results have been contributed to EUREF GPS analysis, and many international contacts. IERS Conventions 2000 (in progress) endorse our ocean loading data base.

Owing to the BIFROST project, OSO is interested in intensification of absolute gravimetry work as a useful complement to measuring changes related to crustal rebound and sea level changes.

OSO presentations on geodynamics at international conferences

13th Working Meeting on European VLBI for Geodesy and Astrometry, Viechtach, Feb. 1999

Haas and Scherneck (Ocean Loading)

IUGG/IAG Birmingham, July 1999

Johansson et al., (BIROST); Haas and Scherneck (Ocean Loading)

Scherneck et al., (BIFROST); Scherneck et al., (Ocean Loading)

World Stress Map Conferece Oskarshamn, Sep. 1999

Bergstrand et al., (BIFROST) Haas et al., (Strain from VLBI); Scherneck et al., (BIFROST)

GPS99 Tsukuba, Oct 1999

Haas et al., (European VLBI), Scherneck et al. (BIFROST)

Colloque AGRET, Paris, Nov. 1999

Scherneck et al (BIFROST)

AGU Fall Meeting, San Francisco, Dec. 1999

Haas and Scherneck (Ocean Loading); Scherneck et al. (BIFROST)

IVS First General Meeting, Kötzing, Feb. 2000

Scherneck et al. (Ocean Loading); Campbell et al. (European VLBI)

EGS 2000, Nice, Apr. 2000

Scherneck et al. (BIFROST)

Earth Tide Meeting 2000, Mizusawa, Sep. 2000

Haas (Space Techniques); Scherneck (Tides in boreholes).

WEGENER General Assembly 2000, San Fernando, Sep. 2000.

Scherneck et al. (BIFROST)

Publications on geodynamics

Campbell J, Haas H, and Nothnagel A, 2000. The European VLBI Project.

Proc. First IVS General Meeting, Kötzing, Vandenberg N and Baver K (eds), pp.133-137, NASA/CP-2000-209803

Davis, J.L., J.X. Mitrovica, H.-G. Scherneck, and H. Fan, 1999.

Investigations of Fennoscandian glacial isostatic adjustment using modern sea-level records, J. Geophys. Res., 104, 2733-2747.

Elgered, G., and R. Haas, 1999.

Geodetic Very-Long-Baseline Interferometry at the Onsala Space Observatory 1997-1998, Proc. of the 13th Working Meeting on European VLBI for Geodesy and Astrometry, Viechtach, February 12-13, 1999, edited by W. Schlüter and H. Hase, Bundesamt für Kartographie und Geodäsie, Wettzell, pp. 60-64.

Elgered, G., R. Haas, and L. Pettersson, 1999.

The IVS Technical Development Center at the Onsala Space Observatory, in International VLBI Service for Geodesy and Astrometry 1999 Annual Report, edited by N. R. Vandenberg, NASA/TP-1999-209243.

Elgered, G., R. Haas, and H.-G. Scherneck, 1999.

Onsala Space Observatory - IVS Network Station in International VLBI Service for Geodesy and Astrometry 1999 Annual Report, edited by N. R. Vandenberg, NASA/TP-1999-209243.

Haas, R., and A. Nothnagel, 1999

A two-step approach to analyze European geodetic Very Long Baseline Interferometry (VLBI) data, Proc. of the 13th Working Meeting on European

VLBI for Geodesy and Astrometry, Viechtach, February 12-13, 1999, edited by W. Schlüter and H. Hase, Bundesamt für Kartographie und Geodäsie, Wettzell, pp. 108-114, 1999.

Haas, R., and H.-G. Scherneck, 1999

The effect of ocean tide loading on the determination of earth rotation parameters, Proc. of the 13th Working Meeting on European VLBI for Geodesy and Astrometry, Viechtach, February 12-13, 1999, edited by W. Schlüter and H. Hase, Bundesamt für Kartographie und Geodäsie, Wettzell, pp. 178-185.

Haas, R., H.-G. Scherneck, G. Elgered, and J.M. Johansson, 1999

The IVS Special Analysis Center at the Onsala Space Observatory, in International VLBI Service for Geodesy and Astrometry 1999 Annual Report, edited by N. R. Vandenberg, NASA/TP-1999-209243.

Scherneck, H.-G.,

Explanatory Supplement: Ocean loading tides, in H. Schuh (ed.) Explanatory supplement to the IERS Conventions (1996) presented by the IAG/ETC Working Group on 'Solid Earth Tides in Space Geodetic Techniques', pp. 19-23, DGFI Report No. 71, Deutsches Geodätisches Forschungsinstitut, Munich, 1999.

Scherneck, H.-G., and R. Haas,

Effect of horizontal ocean tide loading on the determination of polar motion and UT1, Geophys. Res. Lett., 26, 501-504, 1999.

Scherneck, H.-G., and F.H. Webb,

Ocean tide loading and diurnal tidal motion of the solid Earth centre, in Ray, J.R. (ed.) Analysis Campaign to Investigate Motions of the Geocenter, IERS Technical Note 25, Paris Observatory, pp. 83-89, 1999.

Scherneck H-G, Haas H, and Laudati A, 2000. Ocean Loading Tides For In and From VLBI. Proc. First IVS General Meeting, Kötzing, Vandenberg N and Baver K (eds), pp.257-262, NASA/CP-2000-209803

Scherneck H G, Johansson J M, Vermeer M, Davis J L, Milne G A, Mitrovica J X, 2000.

BIFROST Project: 3-D crustal deformation rates derived from GPS confirm postglacial rebound in Fennoscandia, Earth Planets and Space (accepted).