

VLBI Evidence for Glacial Rebound in Europe

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Abstract

The present-day glacial rebound of northern Europe is well recorded in tide gauge records. Less well recorded are the horizontal displacements of the crust associated with the rebound. Predicted rates of displacement are of the order of 1 mm/yr. Reasons for observing rebound include i) the evidence it presents for mantle rheology, and ii) the associated strain field is indicative of the changes in stress of the lithosphere. The VLBI baselines containing information on the horizontal displacements are complementary to the vertical displacements measured by geodetic and geological means, and lead to improved solutions for mantle rheology. Observed baselines between four selected VLBI sites are compared with predictions based on different combinations of earth and ice models to determine optimum rebound parameters. In addition, prediction of rebound displacements are made for potential future VLBI observations using the Crimean and Svetloe sites, as well as a possible mobile site on the Gulf of Bothnia.