



On the analysis of campaign-type long term GPS observations in the polar regions

A. Rülke and R. Dietrich

TU Dresden, Institut für Planetare Geodäsie, Germany

Since more than ten years GPS has revolutionized the position determination and observation of related geophysical phenomena also in polar regions in terms of accuracy and reliability.

Most of the GPS observation data, obtained in polar regions, are analyzed using products of the International GNSS Service (IGS), as satellite orbits, earth rotation parameters etc. Since 1995, five different realizations of the International Terrestrial Reference System (ITRS) have been used for the definition of the geodetic datum.

Changes in the modelling, in the processing strategy and in the reference frame during the history of IGS cause inhomogeneous time series of the estimated parameters, especially satellite orbits, earth rotation parameters or station positions. The use of these time series as a priori information affects the results of analyses of campaign-type GPS data.

We will discuss the importance of a stable reference frame and homogeneous a priori information for the analysis and interpretation of long term campaign-type GPS observations in the polar regions as a vital contribution to the upcoming International Polar Year 2007/2008. The benefits from a rigorous combination of densification networks and a homogeneous global solution in terms of accuracy, reliability and reference frame stability will be outlined in two examples: a precise GPS network in West Greenland observed in repeated observation campaigns since 1995 and the SCAR GPS Campaigns which are carried out under the umbrella of the Scientific Committee on Antarctic Research (SCAR) since 1995.