Geophysical Research Abstracts,
Vol. 10, EGU2008-A-03748, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-03748
EGU General Assembly 2008

The first astro-geodetic reference frame in Norway, 1779-1815

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Military considerations in the early 1770s declared the need for a systematic mapping of the eastern regions of Norway along the border to Sweden. After a failed attempt of direct detailed mapping in the field, the geographical circle was introduced in 1779 to establish a triangular network as a backbone for further positioning of natural and man-made features. The resulting maps were used in preparation of fortresses and planning of defensive field operations. The scale of the triangular network was established by baselines measured on frozen lakes during winter time. Many stations had latitude determinations from circum-meridian observations of the sun and stars to control the precision of the geodetic triangulation. When discrepancies became too large, a new baseline and a new reference point was selected. The original reference point was the flagpole of the fortress at Kongsvinger, which served as the zero meridian for mapping in Norway until 1840. Other reference sites, for which accurate latitude and longitude were determined from several years of astronomical observations, were established in Trondheim, Bergen, and Kristiansand as the original triangular arc was expanded around the entire coast of southern Norway to close at Kongsvinger after 3 decades of observations. This allowed astronomical control of the geodetic results.