



ITRF-BASED NETWORK FOR NAMIBIA

PROJECT TEAM

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The Karlsruhe University of Applied Sciences in Germany and African Geomatics (Pty) Ltd in Namibia jointly carried out two projects called NAM97 and NAM98. These projects involve the establishment of a modern, precise spatial reference network for Namibia. The trigonometrical network currently in use has significant internal distortions and insufficient coverage. The new network will meet state of the art accuracy specifications and facilitate the ever increasing use of GPS, not only in survey applications, but also in navigation and other economic activities.

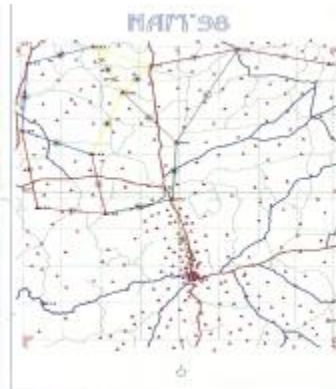


NAM97, NAM98 and IGS-Stations on and around the African Continent

Project NAM97 involved the processing of GPS-observations which were collected at eight strategically distributed base points in Namibia. The network was connected to IGS-Stations (IGS = International GPS Service for Geodynamics). The IGS maintains reference stations and supplies observations as well as additional IGS-products such as precise satellite orbits, station coordinates, plate velocities and ionospheric and tropospheric parameters.

The NAM98 Project

NAM98 was a pilot project to investigate optional strategies for the densification of the NAM97 network. The study was conducted over an area of 200km x 200km and involved the survey of some 30 trigonometrical stations distributed evenly over the area with approximate station to station distances of 50km. The project resulted in a quality assessment of the existing trigonometrical network as well as the establishment of transformation parameters between the trigonometrical and the new ITRF-based datum.



Processing of the GPS-observations was done with the Bernese GPS software. In this way, the effects of the ionosphere and the troposphere could be accounted for. Efficient use could also be made of additional IGS-products which were obtained via the internet. Hence long baselines could be determined to sub-cm-quality.



GPS-observations at a trigonometrical station in Namibia

The quality control and additional processing of the GPS-based results was done using the software packages HEIDI, NETZ2D and GPS3D.

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ANALYSE DER BEOBSACHTUNGSDATEN DER SESSION
KRITISCHER WERT A-PRIOREI 3D-TEST : 4.2
KRITISCHER WERT A-POSTERIOREI 3D-TEST : 4.2
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RELATIVE SESSION-NR. 5
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REDUNDANZ - ANTEIL = 2.378
SIGMA A POSTERIOREI = 0.00112
SIGMA A PRIOREI = 0.00100
GENAUIGKEITSAKTOR = 1.1224
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VON NACH AGL.BASILINE AGL.KO-DIFF VERBESSERUNGEN TESTS
(m) (m) (m) (m) (m) (m)
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DURCHSCHNITTL. MITTL. 2D-LAGEFEHLER 0.0059 0.0052
DURCHSCHNITTL. MITTL. HOEHNENFEHLER 0.0138 0.0125
  
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