Adjustment of the Classical Terrestrial Geodetic Network of Mozambique tied to ITRF

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Linear extension: 9000 km
1:250 000 cartography
950 geodetic points (644 first order)
Side's length: 30-40 km (north)
15-20 km (south)
Tellurometer traverse: 2200 km
16 Geodetic bases (15 invar wires, 1 tellurometer)
16 Laplace stations

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Azimuthal directions with large errors were removed causing discontinuities
Weak connection with the chain at south
GPS re-observation
South latitude: 19º40' - 21º30'
East longitude: 34º10' - 35º10'
Area: 100 x 200 km
45 geodetic points: 35 observed with GPS

Buzi-ZimuaLa Chain

6 Trimble 4000SSI Receivers
(2 base, 4 roving)
3 "permanent" stations (4 full days, forced monitoring systems)

Survey values
• Sync. Rate - 15s
• Min. SVs - 3
• Elevation mask - 10º

Data Processing
• Bernese v.4.2
• GPSurvey v.2.35
• Daily data processing
• Iono-free combination
• Tropospheric refraction model: Saastamoinen/Hopfield
• Connected to geodetic world solution through HRAO (IGS, South Africa)
• Vertical component 6 times less precise than horizontal

Results

Vertical errors are 6 times less precise than horizontal
Tropospheric refraction
Vegetation losses (vegetation)
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- Terrestrial Plus software
- Datum Tete, Clarke ellipsoid 1866
- 775 points (triangulation, traverses)
- 16 geodetic bases
- 171 azimuthal directions
- 90 sides of traverses

**NET WORK A DJUSTMENT (DATUM TETE)**

- **LATITUDE (m)**
  - A: 3.4
  - B: 1.3
  - C: 0.33

- **LONGITUDE (m)**
  - A: 3.9
  - B: 2.4
  - C: 0.51

- **95% (m)**
  - A: 1.1
  - B: 0.25
  - C: 0.005

- **σ (95%)**
  - A: 6.6

**ADJUSTMENT OF THE MOZAMBIQUE NETWORK TO THE WGS84/ITRF94 DATUM**

- Terrestrial Plus software
- Datum ITRF94
- Terrestrial observations
- Fixed 30 GPS points from Moznet (GPS network for urban mapping support)

**CONCLUSION**

- Fixing the GPS coordinates of 30 points common to the classical network improved its quality.
- Adjustment of GPS and terrestrial observations, fixing Tete or constraint to the closest IGS stations, would allow better results.
- GPS re-observation of 30 well-distributed points, to obtain a valid group of vectors, is included in the Portugal and Mozambique Protocol.
- Integration of all networks in the same system.