

ADJUSTMENT OF THE TERRESTRIAL GEODETIC NETWORK OF MOZAMBIQUE TIED TO ITRF

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TERRESTRIAL GEODETIC NETWORK OF MOZAMBIQUE (1932 - 1973)

Linear extension: 9000 km
1:250000 cartography
950 geodetic points (644 first order)
Side's length: 30-40 km (north) 15-20 km (south)
Tellurometer traverse: 2200km
16 Geodetic bases (15 invar wires, 1 tellurometer)
16 Laplace stations

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BUZI-ZIMUALA CHAIN

Azimuthal directions with large errors were removed causing discontinuities
Weak connection with the chain at south
GPS re-observation
South latitude: 19°40' - 21°30'
East longitude: 34° 10' - 35° 10'
Area: 100 x 200 km²
45 geodetic points: 35 observed with GPS

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GPS SURVEYING AT BUZI-ZIMUALA CHAIN

6 Trimble 4000 SSI Receivers (2 base, 4 roving)
3 "permanent" stations (4 full days, forced centering systems)
8h sessions
Surveying values

- Sync. Rate - 15s
- Min. SVs - 3
- Elevation mask - 10°

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DATA PROCESSING

- Bernese v.4.2
- GPSurvey v.2.35
- Daily data processing
- Ionosphere-free combination
- QIF-Strategy (Bernese)
- Tropospheric refraction model: Saastamoinen/Hopfield
- Connected to geodetic world reference through HRAO (IGS, South Africa)
- Error ellipses scaled to be more realistic

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RESULTS

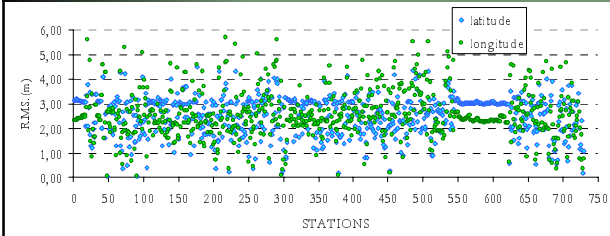
RMS (m)	Lat	Long	Alt
Puge	0.008	0.075	0.452
Vudje	0.004	0.004	0.031

Vertical component 6 times less precise than horizontal
Tropospheric refraction
Signal loss (vegetation)

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NETWORK ADJUSTMENT (DATUM TETE)

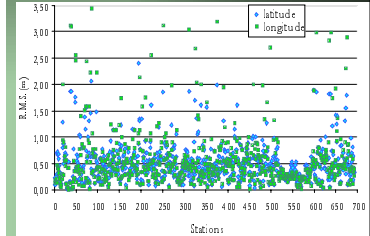
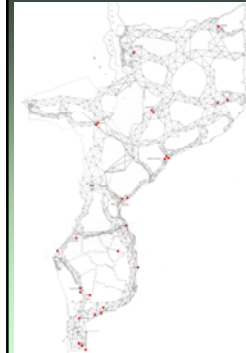
- ◆ Trimnet Plus software
- ◆ Datum Tete, Clarke ellipsoid 1866
- ◆ 726 points (triangulation, traverse)
- ◆ 3731 azimuthal directions
- ◆ 163 azimuthal angles
- ◆ 16 azimutes de Laplace
- ◆ 16 geodetic bases
- ◆ 90 sides of traverse



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ADJUSTMENT OF THE MOZAMBIQUE NETWORK TO THE WGS84/ITRF94 DATUM

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

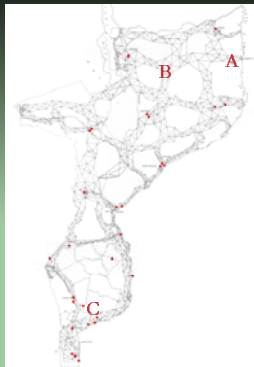


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ADJUSTMENT OF THE MOZAMBIQUE NETWORK TO THE WGS84/ITRF94 DATUM

Classical (ITRF94) – Moznet (ITRF94)

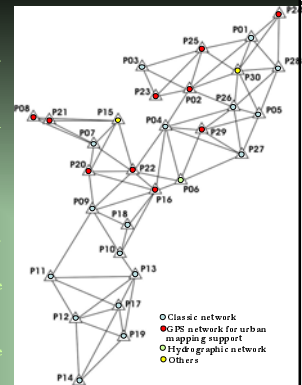
	$\Delta\phi$ (m)	$\sigma(95\%)$ (m)	$\Delta\lambda$ (m)	$\sigma(95\%)$ (m)
A	3.4	3.9	1.1	6.0
B	1.3	2.4	0.25	1.5
C	0.33	0.51	0.006	0.66



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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



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