USING THE TRILATERATION METHOD FOR TECTONICS OF UZBEKISTAN

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Electronic and Laser instruments
Geodynamic polygon
GNSS measurements
Classical geodetic network

\[ \sigma_F = m \sqrt{\frac{1}{P_F}} \]

\[ N^{-1} = Q = \begin{pmatrix} Q_{11} & Q_{12} & \cdots & Q_{1m} \\ Q_{21} & Q_{22} & \cdots & Q_{2m} \\ \vdots & \vdots & \ddots & \vdots \\ Q_{m1} & Q_{m2} & \cdots & Q_{mm} \end{pmatrix} \]
Tavaksay geodynamic polygon
**Calculations**

### Initial coordinates of the base station

<table>
<thead>
<tr>
<th>CIRC</th>
<th>WGS84</th>
<th>CK42</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>41°34'20.766&quot;</td>
<td>41°34'20.047&quot;</td>
</tr>
<tr>
<td>L</td>
<td>69°39'39.090&quot;</td>
<td>69°39'41.770&quot;</td>
</tr>
<tr>
<td>H</td>
<td>770.589m</td>
<td>805.911m</td>
</tr>
<tr>
<td>X</td>
<td>4604440.020</td>
<td>4604418.212</td>
</tr>
<tr>
<td>Y</td>
<td>12555118.680</td>
<td>12555180.944</td>
</tr>
</tbody>
</table>

### Diagonal elements of the covariance matrix

<table>
<thead>
<tr>
<th>№</th>
<th>$\sigma_{x(m)}$</th>
<th>$\sigma_{y(m)}$</th>
<th>$\sigma_{z(m)}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.002</td>
<td>0.003</td>
<td>0.003</td>
</tr>
<tr>
<td>2</td>
<td>0.002</td>
<td>0.003</td>
<td>0.003</td>
</tr>
<tr>
<td>3</td>
<td>0.002</td>
<td>0.004</td>
<td>0.004</td>
</tr>
<tr>
<td>4</td>
<td>0.002</td>
<td>0.003</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>X(m)</td>
<td>Y(m)</td>
<td>B\text{ wgs84}</td>
</tr>
<tr>
<td>---</td>
<td>-----------</td>
<td>-------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>4</td>
<td>4604418.212</td>
<td>555180.944</td>
<td>41°34' 20.766</td>
</tr>
<tr>
<td>2</td>
<td>4604511.723</td>
<td>554213.899</td>
<td>41 34 24.034</td>
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<tr>
<td>3</td>
<td>4604900.210</td>
<td>555222.062</td>
<td>41 34 34.861</td>
</tr>
<tr>
<td>ast</td>
<td>4604197.524</td>
<td>554521.354</td>
<td>41 34 36.361</td>
</tr>
</tbody>
</table>
CONFERENCE

Annual International Scientific Conference
242nd Anniversary of
Moscow State University of Geodesy and Cartography

24-26 May, 2021
Moscow, Russia
MIIGAIK

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PhD in Engineering
MEMORANDUM OF UNDERSTANDING

Between

National University of Uzbekistan
named after Mirzo Ulugbek,
Uzbekistan

and

Space & Earth Geodetic Analysis Laboratory
Covilhã, Portugal
Benchmark reconnaissance
In the future

- to improve a classical geodetic network for seismic region
- to work out GNSS network for geodynamic polygon
- to investigate trilateration method
- to determine changing of coordinate system
- to create digital elevation model of seismic region
GNSS network of Uzbekistan

Conclusion

Establishing a connection between modern vertical movements of the earth's crust and tectonic movements of past geological periods allows us to reveal the patterns of change in the fault. To monitor changes, a regional tracking system for geodynamic phenomena should be developed using high-precision geodetic and GNSS measurements.


Thank you for your attention