

COMPLEX GEODYNAMICAL INVESTIGATIONS IN THE AREA OF THE USSR ACADEMY OF SCIENCES CENTRAL ASTRONOMICAL OBSERVATORY AT PULKOVO

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For astronomical, geodetical and geodynamical investigations as well as for practical applications the inertial coordinate system is widely used which is based on the Fundamental Star Catalogue FK5 together with local coordinate systems in observation stations on the Earth's surface which are intrinsically connected with the geometry of the gravitation field..

Instrumental observations forming the astronomical data bases are affected, however, by the influence of changes in local conditions which are generated by various endogenic, tectonic, exogenic, and/or anthropogenic (technogenic) factors on either of local, regional and global scales.

Construction of large industrial and social objects, growth of cities, intensive consumption of underground waters, oil, gas and other natural resources, ever growing economy engineering activities of man lead to changes in the conditions and characteristics of the environment, to distortion of natural physical fields, to local and regional deformations of the Earth's crust at the sites of fundamental astronomical, geodetic and geophysical precision measurements, locations of old observatories, stations and bench-marks, to distortion and disturbance in the homogeneity of long-term observational sets.

Pulkovo Observatory is situated near a large modern airport, a big industrial city, which has grown considerably for the last decades and in the area of the regional piezometric depression, formed in the Gdov horizon as a result of intensive consumption of underground waters.

A geodynamic polygon has been organized for investigations of anthropogenic processes, stability of the Earth's surface and the gravitational field in the region. The complex studies at the polygon are based on the Kronstadt depth gauge; on the levelling gauge and geodynamic complex at Shepelevo; on latitude, longitude and laser observations at Pulkovo; on metrological gravimetric and geodynamic studies at the underground observatory of D.I. Mendeleev Institute of Metrology at Lomonosov. Geodetic, astronomical, gravimetric and hydrogeological studies are based on deep drill hole bench-marks, similar to bench-mark stations in Tallinn, which have proven to be rather efficient. In view of an increasing role of anthropogenic factors in the future it seems very appropriate that the IAU and IUGG discuss the problem of local condition change investigations on the sites of astronomical and geodynamical observatories at a particular symposium.