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Local improvement of the transformation parameters of coordinates

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The definition of a geodetic reference frame by modern techniques (GPS) requires a determination of transformation parameters from the existent to a new reference systems. The given method of determination transformation parameters is based on creation of the transformation field by the least-square collocation method. The main task of the given work was to propose the method of determination transformation parameters between new and classic reference systems.

The main problem for realization such transformation were the small quantity of general points, which coordinates’ are known in two systems, and their irregular distributing. The basic data for the decision of the given task were possible values of differences of geodetic coordinates between existing and new reference systems, which were received after the real results of researches. We had chosen the local district with sizes $1{,}5^{\circ} \times 1^{\circ}$.

For 25 points in chosen local district by the method of generation of random numbers were calculated geodetic differences between new and classic reference systems. Received values of geodetic differences were used as basic data.

For creation transformation field the geodetic differences were prognosed on the node of regular grid with a step $0.1' \times 0.1'$ by the least-square collocation method. Using the same principles, we had prognosed the differences of geodetic coordinates for a point, in which it is necessary to model transformation parameters from the existent system to a new reference system. Getting the differences of geodetic coordinates for the given point, we had calculated transformation parameters for local region from the existent system to a new reference system by the transformation formulas of co-

ordinates' differences from the one system to another. In general the value of error of coordinate transformation is near 3 m for Ukraine. The got parameters allow to promote transformation at local region between the systems with precision 2 cm.