

Velocities Validation in the new Russian Reference Frame GSC-2011

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SUMMARY

The new spatial reference frame GSC-2011 is being introduced in Russia. It will have replaced the previously used SC-95 and SC-42 by the end of 2016. By its definition the underlying coordinate system corresponds to ITRS in terms of origin location and axis orientation. Coordinates of reference points in GSC-2011 coincide with ones in ITRF2008 at one centimeter level at the reference epoch January 1, 2011, according to evaluation carried out by the Russian federal Center for Geodesy, Mapping and Spatial Data Infrastructure which is responsible for development and maintenance of the reference frame. Apparently, the quality of the velocity estimates has not been investigated previously despite its crucial meaning for preserving high level of integrity of the reference frame over long periods of time.

The paper presents results of consistency evaluation of the published GSC-2011 velocities set with the ITRF2008 velocity field and also with available tectonic plate motion models, such as GEODVEL, MORVEL, NUVEL-1A. It is shown that deviations are typically below 1 cm/year. The outliers have been detected for Yekaterinburg (EKTR) and Vladivostok (VLDV) reference stations.

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