Geophysical Research Abstracts
Vol. 20, EGU2018-19586, 2018
EGU General Assembly 2018

Spatial correlations in IGS station position time series

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The International Terrestrial Reference Frame (ITRF) is a global reference frame which allows precise global positioning at the Earth's surface. It is used in many civil and scientific applications including sea-level rise monitoring, which needs a global and precise frame.
A direct application of ITRF is the determination of the angular velocity of tectonic plates by use of the station velocities. However, in order to improve this determination, a better analysis of individual station velocity uncertainty is necessary. For this, ITRF input coordinate time series need to be analyzed in order to determine the most appropriate noise model. In this study, GNSS station position time series provided by the International GNSS Service (IGS) are investigated with a particular focus on spatial dependencies. This study evaluates the effects of taking into account the spatial dependencies of the series on the determination of station velocities.