

Assessing ITRF Conversion Models for Kinematic GNSS Topographic Mapping in Coastal Areas: A Case Study in Egypt

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SUMMARY

Global Navigation Satellite Systems (GNSS) surveying has been extensively performed for a wide range of mapping activities. Precise Point Positioning (PPP) is considered a major approach for collecting and processing 3D GNSS data for static and kinematic applications. Processing PPP data results in 3D coordinates based on the most recent International Terrestrial Reference Frame (ITRF) while a national mapping system might be related to another frame. This study aims to investigate several simple ITRF transformation formulas (between ITRF2014 and ITRF1996), within the accuracy limits of kinematic surveying, particularly in coastal areas in Egypt. Twelve coordinate transformation methods, in 3D and 2D scenarios, have been analyzed using about two thousands GNSS points along the Red sea coastlines. Accuracy analysis has been performed for each model trying to figure out the optimal approach to be utilized in topographic mapping projects in Egypt.

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