

## On the stability of regional reference frames in Greece using GNSS permanent stations

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**Abstract.** Dionysos Satellite Observatory (DSO) has been actively involved in GNSS data processing since the late 80s. For the last decade, DSO has been routinely processing GNSS data from a list of permanent stations, installed maintained and distributed by various institutes.

Over the last years, this routine processing scheme has been enlarged with in-house software, to include coordinate time-series analysis tools and surface deformation modeling, including estimation of strain rates. This complex, multi-step, crustal deformation monitoring platform enables an in-depth study of the tectonic setting of Greece, and its influence in the stability of regional reference frames used within the country.

Currently, GNSS data from over 300 stations in Greece have been or are routinely analyzed, efficiently divided in subnetworks. Satellite data processing is followed by subsequent, routine, time series analysis. Results from the latter are in turn used to periodically monitor crustal deformation patterns.

In this study, results from up to 100 stations with available data for a period greater than 2.5 years, distributed throughout the region of Greece have been used. Respective daily coordinate estimates were stacked to form position time series, and analyzed to estimate an as dense as possible velocity field.

Different kinematic models for the region were investigated with the aim of utilizing them in the implementation of regional reference frames in the region of Greece.

Finally, strain tensor rates are calculated from the velocity field for the whole region using StrainTool software and with different algorithms.