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Reprocessing of the CEGRN network and its impact on the geodynamics of Central Europe

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The IAG Working Group on "Integration of Dense Velocity Fields in the ITRF", the EUREF Working Group on Deformation Models and the project EPOS encourage initiatives aiming at estimating velocities of GNSS sites in a rigorous manner, both for reference frame applications and 3D tectonic deformation problems. Thirteen measurement campaigns between 1994 and 2013 with epoch and permanent GNSS stations make the CEGRN network one of the most regularly and accurately surveyed networks for scientific applications in Europe. We have reprocessed the CEGRN GNSS (GPS+GLONASS) data with the Bernese Software 5.2 using consistent IGb08 orbits and antenna models and aligned the resulting network to ETRF2000 Reference Frame using the position and velocities of Class A stations of the EUREF Permanent Network (EPN). The intent is to bring down to regional, i.e. Central European scale the same standard of accuracy as the EPN long-term solution. This paper presents first results of the CEGRN densification of the EPN: we review the input data, the processing strategies and the results, in terms of positions, velocities and Helmert parameters. Possible further combination, in a rigorous geodetic sense, with multiyear regional solutions, for example in Greece and Italy, processed with similar standards have an important potential to quantify the deformation field, for example in the Balkans. Preliminary results on possible locking depths and areas of higher probability of failure are reviewed.