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European velocity field from several GPS solutions

C. Ferraro (1), C. Sciarretta (1), R. Devoti (2), G. Bianco (3), F. Vespe (3) (1) Telespazio SpA, ASI-CGS, Matera, Italy, (2) Istituto Nazionale di Geofisica e Vulcanologia, Roma, Italy, (3) Agenzia Spaziale Italiana, Centro di Geodesia Spaziale, Matera, Italy

The Matera Space Geodesy centre, ASI CGS, has been elaborating, since 1996, data from a GPS permanent network, formed, at present, by nearly 50 sites spread in Europe with a dense coverage of the Italian peninsula. The temporal extension of the majority of coordinates time series relevant to the area, is now long enough to allow the reliable estimation of a velocity field. Presently, the international geodetic investigation is directed towards the combination of global geodetic solutions, both intraand inter-technique, as proved by the recent IERS activities ("ILRS Position+EOP Pilot Project", "IERS Combination Pilot Project"), of which ASI-CGS and INGV are active contributors. Methods and techniques, developed for global combinations have been used also in the context of regional solutions combinations: these techniques allow including single regional and/or local solutions, obtained independently, in the common frame defined by a global multi-technique (e.g. SLR+VLBI) solution. ASI-CGS daily solutions have been combined with two European solutions, RGP (Reseau GPS Permanent Francais) and ARE (Austrian Reference Extended). This integration allows densifying and extending the velocity field, besides strengthening the velocity estimation in the case of common sites. From the estimated site velocities, linearly fitted using the complete covariance matrix on the daily positions along a period of two years at least, strain rates have been computed to evaluate the deformation rate of the area. A very dense GPS network gives important elements to geologists and geophysicists to derive tectonic models. Moreover, the ability of integrating different velocity solutions, coming from the same space geodetic technique or from different techniques, allows to connect easily small local network, monitored, e.g by episodic campaigns, to regional or global networks, estimating the velocity field in a consistent way.