

## Data analysis of Permanent GPS networks in Italy and surrounding region: application of a distributed processing approach

*E. Serpelloni, G. Casula, A. Galvani, M. Anzidei, P. Baldi*

### Abstract

We describe the procedures used to combine into a uniform velocity solution the observations of more than 80 continuous GPS stations operating in the central Mediterranean in the 1998-2004 time interval. We used a distributed processing approach, which makes efficient use of computer resources, while producing velocity estimates for all stations in one common reference frame, allowing for an effective merging of all the observations into a self-consistent network solution. We describe the CGPS data archiving and processing procedures, and provide main results in terms of position time-series and velocities for all stations that observed more than three years. We computed horizontal and vertical velocities accounting for the seasonal (annual and semi-annual) signals, and considering the off-sets in the coordinate time-series caused by station equipment changes. Weighted post-fit RMS of the north, east and vertical velocity components are in the range of 1.57-2.08 mm, 1.31-3.28 mm, and 3.60-7.24 mm, respectively, which are reduced by solving for seasonal signals in the velocity estimates. The annual and semi-annual signals in the height components, with amplitudes up to 4.8 mm, are much stronger than those in the horizontal components. The mean amplitudes of annual and semi-annual signals are within 0.18-0.47 mm, 0.23-0.52 mm and 0.55-1.92 mm in the north, east and vertical components, respectively.

### Keywords

Crustal deformations;Satellite geodesy;Data processing;Plate boundaries, motion, and tectonics

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### References

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
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