



Temporal evolution of local tie vectors at Medicina's observatory mingling terrestrial and GPS observations

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Since 2001 a research project at Medicina's observatory has been undertaken aimed at designing, measuring and computing the eccentricity between VLBI and GPS. As a result, Medicina's observatory is endowed with a time series of nearly yearly eccentricities, measured both with a classical terrestrial approach and with a wholly GPS-based one. This information can be regarded as the base for different investigations. In particular, the GPS approach could foster an easier and effective way to address the issue of local ties' computation at sites hosting a VLBI-GPS co-location; in fact our results testify that, if properly computed, indirect GPS based local ties are capable to attain accuracies at millimetre level, compatibly with ITRF requirements for global combinations. As such, scope of this investigation is the consistent analysis of the entire set of local ties by comparing the effectiveness of GPS eccentricities with respect to those terrestrial, as well as their evolution. In order to make them comparable and consistent, each terrestrial eccentricity is mapped onto the final ITRF2000 global frame, by using the same tie points belonging to the control network within the co-located site; once this has been done, the ensemble of eccentricities is somehow coherent and comparable. Furthermore, each local tie represents a highly precise and accurate estimation of the markers that establish the local ground control network; the temporal evolution of the baseline vectors allows an investigation about the stability of the local network and, particularly, can be used for controlling the stability and the evolution of the eccentricity at the co-located site, which, due to different reasons, might potentially be variable in time.