



EPN coordinates: combination of EUREF Analysis Centers' solutions and it's stability

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The observations from European Permanent GPS Network (EPN) are processed by a set of Analysis Centers and the official combined coordinate solutions are available on weekly basis. Fiducial approach used in the processing and changes of the reference frame can cause jumps in coordinates and a distortion of the network. For that reason a new combined coordinate solution for stations of EPN was obtained with the minimum constraint approach. The combination is done in three steps: first the stated constraints on coordinates are removed from the individual solutions of the Analysis Centers using a-priori information provided in SINEX files. Then deconstrained solutions are aligned to ITRF2000 using 7 parameters Helmert transformation, catalogue velocities were used here for the propagating ITRF2000 stations' coordinates from the catalogue's epoch 1997.0 to the epoch of each GPS week. Finally all individual solutions are combined using sequential Least-Squares Adjustment method. All data from the week 900 till the week 1296 were used. Investigation of the stability of the new combination was performed. Time series of transformation parameters from the new combined solution into ITRF2000 were expected to be stable, with no linear trends since here also for each GPS week the catalogue coordinates were propagated to the epoch of the respective week. No jumps were expected at the week 1143 when ITRF2000 replaced ITRF97. The time series of the transformation parameters showed good stability, small jump at the week 1143 occurs only in scale, some systematic component occurs in the time series for y-translation and scale. Both these effects can be caused by not sufficient constraints removal. Comparison of the new combined coordinate solution and the official one is presented.