On the Consistency of GIPSY-X and GIPSY-OASIS with Samples

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ABSTRACTION: GIPSY-OASIS is a software package from NASA JPL for GNSS data analysis. This software is based on Precise Point Positioning (PPP) schemes. The raw observations from GNSS were used for the analysis and all errors are removed or reduced through modelling. Due to the nature of nearly no correlation to any other GNSS stations, PPP approach provides a unique way for "absolute" positioning which is extremely meaningful for surveying datum monitoring. With the adaption of modern programming technique, JPL produced a major revision of this software in 2017, and named GIPSY-X. While the processing efficiency of GIPSY-X is reported to be much superior to GIPSY-OASIS, the quality of output remains about the same. The objective of this study is to confirm this statement with practical datasets. Four CORSs were included in this experiment, namely, NCTU located in Hsinchu, TWVD located in Keelung, TNSM located in Dungsha island, and NASM located in Taiping island. Daily solutions in static mode were derived for about 3 years of each station. The result shows that the mean of difference between GIPSY-OASIS and GIPSY-X for both stations are less than 10 mm in N, E, h components. The standard deviations of differences are different among CORSs, from 1.5mm to 50mm. The standard deviation of differences are highly related to the reported standard deviation from GIPSY-OASIS and GIPSY-X processing.