



## **Accuracy of GIPSY PPP from version 6.2: a robust method to remove outliers**

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In this paper, we figure out the accuracy of GIPSY PPP from the latest version, version 6.2. As the research community prepares for the real-time PPP, it would be interesting to revise the accuracy of static GPS from the latest version of well established research software, the first among its kinds. Although the results do not significantly differ from the previous version, version 6.1.1, we still observe the slight improvement on the vertical component due to an enhanced second order ionospheric modeling which came out with the latest version. However, in this study, we rather turned our attention into outlier detection. Outliers usually occur among the solutions from shorter observation sessions and degrade the quality of the accuracy modeling. In our previous analysis from version 6.1.1, we argued that the elimination of outliers was cumbersome with the traditional method since repeated trials were needed, and subjectivity that could affect the statistical significance of the solutions might have been existed among the results (Hayal and Sanli, 2013). Here we overcome this problem using a robust outlier elimination method. Median is perhaps the simplest of the robust outlier detection methods in terms of applicability. At the same time, it might be considered to be the most efficient one with its highest breakdown point. In our analysis, we used a slightly different version of the median as introduced in Tut et al. 2013. Hence, we were able to remove suspected outliers at one run; which were, with the traditional methods, more problematic to remove this time from the solutions produced using the latest version of the software.

### References

- Hayal, AG, Sanli DU, Accuracy of GIPSY PPP from version 6, GNSS Precise Point Positioning Workshop: Reaching Full Potential, Vol. 1, pp. 41-42, (2013)
- Tut, İ., Sanli D.U., Erdogan B., Hekimoglu S., Efficiency of BERNESE single baseline rapid static positioning solutions with SEARCH strategy, Survey Review, Vol. 45, Issue 331, pp.296-304, (2013)