Annales
Geophysicae

Discussions

EGU

Interactive comment on "**PPP-based Swarm kinematic orbit determination**" *by* **Le Ren and Steffen Schön**

Anonymous Referee #2

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Dear author, In your paper "PPP-based Swarm kinematic orbit determination" you discuss an alternative processing strategy for Swarm kinematic orbits. First you analyze the tracking performance, then you describe your outlier, cycle slip detection schema and correction for the day boundary. At the end you compare your results to other providers and analyze the covariance matrix. First of all I want to thank you for the nice presentation of your work the text is well written and the steps you took in the processing are well motivated and can be understood.

My major concerns belong to chapter 2.2:

1. First paragraph: sound analysis means frequency analysis? Did you do this? I only see time dependent or elevation dependent plots.

2. Second paragraph: 1/sqrt(sin) you should mention where this dependence is coming from and what could be the cause why it is not fulfilled after fixing the RINEX converter. I would not even state that it fits well before the fixing. Please discuss in more detail what a deviation from 1/sqrt(sin) means.

3.Third paragraph: second difference is not a good expression for the difference of differences, please explain in more detail.

4.With the construction of these differences of the differences a problem is accompanied, namely in giving this quantity an unit. You chose m (as it is a difference of two meter values) but this value is in some parts dependent on the sampling rate so m/s^2? but this is also not really correct as we do not talk about accelerations. You can stick to meter, but you should be aware that is this somehow an arbitrary unit and it is only useful in comparing the same data set. What you mention in the text. You should make this clear and I would even prefer to indicate the fact in the plots by using "arbitrary units". In this sense also your paragraph 6 where you discuss the 8 and 9mm noise level of this quantity is not adequate. You should just compare xx times higher in the regions of the poles and equator.

5. You should also stick to standard deviation 1sigma or 3sigmas but do not mix it. 6. Paragraph 4 is wrong: difference of differences of L3 can have strong influence left from the ionospheric fluctuations. Two frequencies do not take exactly the same path through the ionosphere and therefore depending on the size of the fluctuations can have a totally different instantaneous effect on L1 and L2 what you extract by building the differences. So this is probably no issue of the receiver.

Section 2.3

1. Equation 3 b1 and b2 have no unit (but in the equation meters are needed)

2. Line 14 page10: what does n stand for? Which value does it have?

Minor points:

1. Page 2 line 26 An approach . . .

2. Page3 paragraph 2 and 3 belong together

3. Page 3 line 23: Another reason for tracking less than . . .

4. Page 5 line 8: errors

5.Page 6 line 5 degrades

Kind regards, the reviewer

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