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Interactive comment on "Estimating Satellite and Receiver Differential Code Bias Using Relative GPS Network" *by* Alaa A. Elghazouly et al.

Anonymous Referee #2

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In the article the authors suggested a technique for "Estimating Satellite and Receiver Differential Code Bias". While the problem of DCB estimation is important enough it is difficult to find what new was done in the article. The authors used well-known approach based on spherical harmonics (SH), which was suggested by S. Schaer et al. (1998). Similar approach based on SH was used for M_DCB: MATLAB code by Jin et al. (2012). Recently a lot of article have been published containing new results on DCB and DCB estimation, for example applying convolution algorithm (Q. Li et al., 2018), applying SH along with trigonometric series (Z. Li et al., 2015), applying spherical cap harmonic for regional modeling (Liu et al., 2010), using combination of Minimum scalloping/Least squares/ Zero TEC method (Rideout & Coster, 2006), as well as indicating problems and solution for Compass/Beidou DCB (Z. Li et al.,

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2012), new results on strong annual DCB variations (Mylnikova et al., 2015), grounding influence on DCB (Choi and Lee, 2018), plasmasphere influence on DCB estimation (Themens et al., 2015) etc. Submitted article by Elghazouly et al. does not use the background.

Another issue is that in Europe there are at least several hundred stations. Correct analysis (see "second issue" in the article) should contain results (for several stations) for densest network, less dense, . . . one station.

There are also a general problem: nobody knows the real DCB. That make me doubting about 3rd conclusion "The most effective factor in DCBs estimation is using multi station network instead of single station that appeared from results which improved from 1.1866 ns and 0.7982 ns maximum DCB mean differences for M_DCB and ZDDCBE single station analysis to 0.1477 ns for MSDCBE. So, using multi station network DCB estimation- if available- is strongly recommended". The results only say that used techniques are similar. So, that requires testing the technique based on the modeling results.

Such requirements are for article submitted to Annales geophysicae. It seems that the authors would like to publish "software article" ("The current study proposes a new MATLAB code"), so I would recommend to look for "software journal" (like, for example, The Journal of Open Source Software).

Minor comments:

1) While the article contains some interesting results the poor organization of the article make it difficult to understand and make sure that they are correct.

2) There are a lot of formulas in the article but actually only 12-16 are used

3) There are different errors. "By substituting eq (11) and eq (13) into eq (10) we get". Actually (8), (9) and (10) into (11). "following equations (14, 15 and 18)" – there is no (18).

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