

Interactive comment on “Asthenospheric anelasticity effects on ocean tide loading in the East China Sea region observed with GPS” by Junjie Wang et al.

Anonymous Referee #2

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Review of “Asthenospheric anelasticity effects on ocean tide loading in the East China Sea region observed with GPS” by Wang et al.

General comments

This paper covers work on extending the methods and results obtained by the authors in their 2 papers in 2015 (Penna et al. and Bos et al.). These previous papers showed the importance of including the effects of anelasticity in the OTL model computations for continuous GPS sites in western Europe. The present paper demonstrates that anelasticity is also important in the East China Sea region. This is a completely different type of tectonic area. This is therefore a very important paper and shows that

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anelasticity in the asthenosphere should be considered in OTL computations at most sites, within a few hundred kilometres of the coast, around the world. The paper again shows that the continuing dense network of GPS stations around the world provides a very useful data resource for tidal research, as well as the more common use for studying long term crustal movements. The methods used and the results are very clearly described in the paper and I strongly recommend that this paper should be published in this journal. A few mostly relatively minor comments are given below.

Specific comments (1) The first part of the introduction gives a useful summary of previous work on using CGPS for tidal research. On page 2, line 9 it would be useful to mention that the GPS results from Yuan et al. (2013) were used by Lau, Mitrovica, ... (Nature September 2017) to look for lateral variations in body tide models of the lower mantle. (2) Page 3, line 16 (also page 7, line 5). It would be worth pointing out that Baker and Bos (2003, Fig. 9) used tidal gravity observations in Wuhan, China, to show that there are major problems with the earlier set of FES ocean tide models in that area. (3) Page 5, line 32. STDs of the phasor differences. ... should be STDs of the amplitudes of the phasor differences. (4) In Figures 4 and 5, it is very difficult to see all the phasors in Kyushu and the maps look very jumbled in that area. It is not easy to get round this problem. Maybe it would be better to reduce the number of sites/phasors and say that for clarity only 50% (or whatever) of the phasors are shown. (5) In Figure 5, the final (red) phasors still show some correlations along the Ryukyu islands. This implies that there is still some information left in these residuals. The authors may want to comment on this. (6) Page 15, line 32. It is stated that the discrepancies are less than 0.8 mm on the Ryukyu Islands. This is not consistent with Table 4 on the same page.

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