Interactive comment on “Tidally-induced velocity variations of the Beardmore Glacier, Antarctica, and their representation in satellite measurements of ice velocity” by O. J. Marsh et al.

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We thank the reviewer for their comments and have investigated the t_tide package for tidal analysis. Using this software we are able to identify tidal components with high signal to noise ratio at GPS-2 and GPS-3 but the signal is too small at GPS-1 and the data is too sparse at GPS-4. We have included a figure showing the phase of the tides at these two sites related to the CATS_2008opt tide model, similar to Figure 3 from Gudmundsson (2007) and showing the same general patterns as at the Rutford Ice Stream. As expected we could not solve for both MSf and Mf with a high degree of confidence, although could solve each component independently. We have
restructured some sections in line with reviewer #1’s comments and elaborated on our methods, particularly relating to the tidal analysis.

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Fig. 1. Phase difference between measured horizontal displacements at GPS-2 and -3 and modelled vertical ocean tides from the CATS_2008opt tidal simulation (Padman et al., 2008).