EGUsphere, referee comment RC2
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Comment on egusphere-2022-252

Anonymous Referee #2

Referee comment on "Technical note: On seasonal variability of the M_2 tide" by Richard D. Ray, EGUsphere, https://doi.org/10.5194/egusphere-2022-252-RC2, 2022

This manuscript on the seasonality of the M2 tide is an extremely relevant publication for the Ocean Sciences journal. Although, as the author states, the manuscript really summarises several well-known points and introduces evidence on these theories that date back to the early 1900s, the manuscript produces a comprehensive description that is of significant value to the tidal community. A general description of the tides, their sources and their relationships is in itself a valuable contribution and something often overlooked in the tidal community. I am very much a fan of Table 1 in providing very simple and important details. This manuscript will, therefore, be a valuable source of knowledge for the greater tidal community. Overall, the manuscript itself is a pleasure to read. Although, in my opinion, the manuscript is publishable as is, I do have a couple of comments which can hopefully clarify some points within the manuscript.

- One point the author highlights is the length of the time series of data needed to separate the tidal constituents within the M2 tidal band. The explanations in Table 1 and Figure 1 demonstrate this nicely. I guess what is not clear, what is the implications when one does not have a long enough time series, on the estimation of the M2 and the overall tidal height prediction? Should one where possible directly estimate these sidelines and if not possible, what are the implications on the accuracy of tidal predictions? I realise the sidelines are usually fractions of the main M2, but the Chittagong application for example demonstrates significantly large modulations. This is of course more critical in tide gauges/bottom pressure sensors that have less than a year's worth of data or less frequent sampling patterns such as altimetry observations.
- When reproducing the tide gauge evaluation in section 3, I found the same results as the author. However, in the period selected by the author, I noted a large temporal gap in the University of Hawaii dataset for Port Orford (shown below). I checked this with the PSMSL data (https://www.psmsl.org/data/obtaining/stations/1640.php) as well as GESLA-3 (flagged as -99 below) and UHSLC data. This is not a criticism of the results as these gaps in data are normal, but could this be an explanation for the differences seen in Figure 2? It could also be that the author has appropriate data from this tide gauge.

Figure. SLA over time of the Port Orford tide gauge as obtained from GESLA-3.