Comment on egusphere-2022-252
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This is a nice paper which clarifies the seasonality of M₂ tide. For a long time, I am puzzled about the use of H₁ for a semi-diurnal wave and it seems that no one (except this paper) can give me the answer. I have few suggestions which may further improve this paper.

First, I strongly suggest the author to also discuss the seasonality of S₂, K₁ and O₁ tides. In most previous studies, they only focus on the seasonality of M₂ but ignore S₂,K₁ and O₁. In fact, there are also lots of confusion on the seasonality of S₂/K₁/O₁ tides. Du and Yu(2021) only clarify some confusion on the seasonality of M₂. When I discussed with them, I was surprise that they did not know the seasonality of S₂, K₁ and O₁ tides at all. The frequency of the K₂ (P₁) tide is equal to that of the S₂ (K₁) plus (minus) the frequency of the semi-annual cycle. When we explore the seasonality the K₁ and S₂ tides, we need to remove P₁ and K₂ tides first via harmonic analysis (HA). However, HA is a frequency-depend method, it can extract the amplitude and phase of one specific frequency, thus, HA cannot distinguish different origins of a constituent which means that partial semi-annual cycles of K₁ and S₂ tides are also removed. How to solve this problem?

Second, section 3 shows three nice examples of M₂ seasonality. Maybe you can add some maps/tables of tide gauges and tidal information which can help readers know more about local environment and tidal dynamics.

Finally, the nonlinear interaction between K₁ and O₁ tides can generate KO₂ tide which has the same frequency as M₂. Since K₁ and O₁ tides show clear seasonality, thus,KO₂ should also have clear seasonality which means that the energy of K₁/O₁ seasonality is transferred to M₂ seasonality. Also, the nonlinear interaction between P₁ and O₁ tides can generate OP₂ tide which has the same frequency as MSK₂. Thus, the energy of P₁/O₁ seasonality can be transferred to M₂ seasonality. I think above processes may occur in some coastal areas where diurnal tides are very strong and can be added into the paper.