Reply on AC1
Xiao Hua Wang (Referee)

Referee comment on "River-enhanced non-linear overtide variations in long estuaries" by Leicheng Guo et al., Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2021-75-RC2, 2021

The authors have not addressed my comment on R2T=1 for maximum M4 generation satisfactorily. The R2T ratio close to unity for maximal M4 generation can be explained by explaining the optimum generation of quadratic frictional coefficient terms in the algebraic development discussed in Godin (1999) as we did in Table 5 in our paper. In lines 555-558, the authors mentioned that the quadratic bottom stress term leads to significant M4 generation. The authors can use their model results to analyze the relationship between the R2T ratio and quadratic frictional terms for the generation of M4 tide to explain the unity of the R2T ratio.

It also should be noted that R2T=1 is not applicable to different estuaries (or indeed at different locations in an estuary) for maximum D4 generation. Our paper has demonstrated that an optimum balance between residual velocity and tidal velocity components is also found at R3 and R5 for the Q20 and Q40 scenarios, respectively.