

Interactive comment on “Analytical approach for determining the mean water level profile in an estuary with substantial fresh water discharge” by H. Cai et al.

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In this study, the authors have applied an analytical model to examine the contribution of river discharge and tide to the water level slope along the Yangtze River Estuary. The analytical model may be a useful method to investigate such scientific problems. However, I have two arguments for this paper as follows. Firstly, the analytical model used in this paper have been mentioned in author’s other paper (Cai et al., 2014), and therefore this paper just applied an existing analytical model. Secondly, I doubted the applicability of the analytical model to the Yangtze River estuary. The Yangtze River estuary is a complicated branched estuary with three-order branches and four outlets

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into the sea. The Yangtze River Estuary branches into the North Branch and the South Branch, and further the South Branch branches into the North Channel and the South channel, and finally the South channel branches the North passage and South passage. The South Branch has been the main channel delivering the water and sediment discharges into the sea, and the North Branch is dominated by the tide dynamic. The South Branch and the North Branch were considered as a unity (Zhang et al., 2012). There were many reports on the flow backward of water, sediment and salinity from the North Branch to the South Branch. Therefore, only applying the analytical model to analyze the tide-river interaction along the South Branch of the YRE may be doubtful in this paper. Reference: Zhang, E. F., Savenije, H. H. G., Chen, S. L., and Mao, X. H.: An analytical solution for tidal propagation in the Yangtze Estuary, China, *Hydrol. Earth Syst. Sci.*, 16, 3327–3339, doi:10.5194/hess-16-3327-2012, 2012. 8391, 8392

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