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Interactive comment on "Effects of bottom topography on dynamics of river discharges in tidal regions: case study of twin plumes in Taiwan Strait" *by* K. A. Korotenko et al.

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This paper raises the potentially interesting question of how the structure of river plumes entering the coastal ocean are affected by the ambient tidal mixing regime. This question is addressed by a series of model experiments centred on the discharge of two rivers in the Taiwan Strait. In my view, the results presented do not fully illuminate the contrast between the two plume regions, nor do they convincingly identify the processes involved. In part this is because there is no adequate observational data base with which to challenge the model output but it also reflects the lack of a clear strategy in the use of the model to test the authors' hypothesis that the differences

in the plumes are the result of differences in the level of tidal stirring in the adjacent coastal zone. They do demonstrate that the level of tidal stirring is different in the two cases, mainly because of the different topography, but they do not use the model to discriminate between the effects of vertical mixing (manifest in its effect on tidal shear diffusion?), horizontal mixing and WAD (wetting and drying) effects associated with coastline differences. The use of a second model (STRIPE) seems questionable at least until it has been shown to produce results consistent with those from POM for non-WAD scenarios; wouldn't a model with a proven WAD capability (e.g. GETM) have been a better choice for all runs ?

In devising a revised strategy for model runs to clarify the mechanisms responsible for the differences between the two plumes, I would suggest that the authors consult more fully the now extensive literature on ROFI dynamics which describes, on the basis of detailed observations and modelling, the sometimes subtle processes operating in ROFIs (e.g. see the work of Gerben de Boer and co-authors as well as the modelling studies of Burchard and others). The presentation of the literature in the present draft amounts to little more than a list and does not do justice to the current state of process understanding in ROFIs. The authors should also present a fuller picture of other differences between the two plumes, notably in spatial sections of density stratification, a feature of central importance in understanding processes which, though implicit in figure 10, is not shown. More observational data on such aspects would be helpful though I realise that such data may not be available without further observational campaigns. There are many smaller points which need attention, particularly in the figures (e.g. figure 6 where the vectors cannot be resolved even after full zooming !). As I see it , however the paper needs an extensive scientific upgrade before it would qualify for publication in OS and the priority now is to address the fundamental issues indicated above

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