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Interactive comment on "Morphological evolution of bifurcations in tide-influenced deltas" *by* Arya P. Iwantoro et al.

John Shaw (Referee)

shaw84@uark.edu

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This manuscript describes a modeling study that seeks to understand morphodynamic adjustments to bifurcations that occur due to river and tide interaction. A novel set of boundary conditions is used. The key finding is that as tidal forcing or tidal heterogeneity (the use phase lags) increases, the stability or symmetry of the bifurcation increases through adjustments to the sediment bed. The straightforward modeling approach affords a relatively clear view of the controlling processes. It is well written, and a solid improvement to our understanding of river delta networks.

One important question I have after digesting this manuscript is the following (the subject heading): The explanation of flow regulation is that the tidal flow from the bigger

channel pushes flow into the smaller channel (L289, reason one). This sounds like a rising tide phenomenon, where an incoming tidal waves hits the bifurcation from downstream. However, this is probably a relatively low shear stress and sediment transport moment as the tide fights with the river. The paper states that the most symmetric shields stresses occur at peak ebb flow (L264). At this time, I would expect a falling tide in a deeper channel would pull more water and be more asymmetric. Perhaps this could be elucidated with a Psi_tau*max plot over a tidal period? It would help me understand this key aspect of the system.

Figure 8-11 show correlations of various strength between asymmetry and modeling runs. I am quite surprised by the scatter for example in Fig. 9. With a model that is so simply designed, I would like to know where the scatter comes from. Even if the authors suspect is from numerical errors, it would be good to know. The authors' intuition for this is far better than mine (or the average reader). No information was given about initial bed elevation or bed slope, which seems like an important boundary condition for tidal waves and backwater dynamics. If the system was initialized with a uniform elevation, that information will suffice. Modeling 0.25 mm sediment (L104) in a large tidal system seems too large to be characteristic of tidal systems. I am not suggesting to redo the modeling, but can you justify this choice further?

Minor Comments L110 I appreciate the discussion of the limitation of the non-adjustible widths. I think it is a reasonable simplifying assumption for this study though. L124 within 800 m of L152-153 over 2km is redundant L166 It took some effort to figure out what eta_i means. I found it in figure 1, but perhaps it could also be explicitly defined in the text here. L234 The Chezy friction factor was set to be constant, so I do not see how differing friction could matter here. Varying depth and the associated reduction in tidal wave celerity is a much more intuitive explanation here. L289 Processes instead of reasons? L326 Findings L351 asymmetrically L354 "relatively ratio" a word is missing here. Figure 2-7. The size and colormaps make these figures very difficult to gather information from. I recommend either adding 2-4 contours to the plots or just using 2-4 colors instead of a spectrum. Basically all of the detail in plots like Figures like Fig7a can't be seen by the reader.

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