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Characterizing the variability of multiple sandbar systems with linear stability

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Multiple sandbar systems have been observed in a variety of settings worldwide. The changes in multiple sandbar systems sometimes result in rhythmic patterns, usually called crescentic bars. The nature of their occurrence has been studied both through observations (e.g. Short and Aagaard, 1993) and numerical studies (e.g. Klein and Schuttelaars, 2006). The development of crescentic bars in multiple sandbar systems is part of sequential beach changes (Short and Aagaard, 1993) displaying a range of configurations that can involve coupling between the sandbars and, sometimes, also the shoreline (Ruessink et al., 2007). Here we use a numerical model based on linear stability analysis to study the role of hydrodynamic conditions and initial cross-shore sandbar profile on the evolution of the double sandbar system. Preliminary results shows various configurations that have been observed in the field and that can be related to a combination of offshore hydrodynamic conditions and initial cross-shore beach profiles.