We thank the anonymous reviewer for the useful comments, which have improved the discussion about the vertical structure of the eddies formed in our simulations, and have suggested interesting possibilities for follow-up studies. We give a point-by-point reply below:

- *Comparisons with the paper Gula, Zeitlin and Bouchut, JFM, 2010, and discussion on dependence of the results on stratification*

In GZB10 the authors investigate the formation of instabilities in a reduced gravity model with a flat bottom. The interaction of the upper layer with the lower one develops a baroclinic instability that leads to the formation and detachment of eddies. These eddies exhibit a characteristic vertical structure, with a single vortex at surface and a dipolar structure at depth.

Given the configuration used in GZB10, the comparison should be made with our flat bottom scenario, shown in figure 6. We argue that the structure of the vortices that detach from the coast shown in figure 6 is similar to the one described in GZB10: the surface vorticity shows a single anticyclone, surrounded by a ring of opposite vorticity, while a clear dipolar structure appears at depth (see figures 6d and 6f in particular). The bottom dipole drives the vortex motion in the upper layer and induces the offshore motion of the coastal anticyclones. Therefore, we argue that, in the flat bottom case, the continuously stratified model we used leads to dynamical patterns which are similar to the one obtained with the two-layer model used in GZB10. On the other hand, a sloped topography is playing a major role in controlling the vertical structure of the instabilities (eddies or meanders), as shown in figure 7 and 8.

We had already partially commented on the vertical structure of the eddies (page 15, lines 14-17), but we have modified and extended that comment with the following:

“However, the vertical structure is not universal and for a similar signature at the surface these coherent eddies could have quite a different structure in the deep layer. Two cases of coastal eddy formation are depicted in figures 6 and 7. In the first case, which corresponds to the flat bottom scenarios, the eddies have a signature at depth that is partially in phase with the surface (figure 6b, d, f). Dipolar structures are formed in the lower layer with a strong vertical alignment of the anticyclonic cores, consistently with the tendency for barotropization of the flow induced by the standard baroclinic instability. A similar pattern was described by Gula et al. (2010) in their investigation of the instabilities of a coastal current flowing over a flat bottom in a two-layer shallow water model, suggesting that the vertical structure of the eddies is not significantly altered by the continuous stratification. The anticyclones cores are more intense and robust at the surface, while the cyclonic vorticity is slightly higher than the anticyclonic one in the deep layer dipoles."

- *Role of coastal Kelvin waves*

Among the large number of experiments performed here we observed the formation of a fast propagating coastal wave signal only in a few cases of the coastal meanders regime. Such fast wave could indeed be linked to the formation of coastal Kelvin waves. However, we didn't focus our attention on this problem since this signal forms only after the flow becomes fully unstable, namely after the non-linear saturation. Hence, even if theses fast waves may induce some local and small-scale dissipation in the long-term evolution they do not affect the formation and the non-linear saturation of large scale coastal structures investigated in this study. Besides, we will need to increase dramatically our spatial and temporal resolution to resolve the possible formation of small-scale Kelvin fronts. Moreover, the periodic boundary condition may also induces some bias on the fast coastal travelling wave, as we have already noted in page 17 "Note that the non-linear interactions of waves is an interesting process in itself, but the wave interactions are likely over-stimulated in these experiments and quite artificial. The reason is that the periodic condition prevents the wave energy to radiate away along the topography and that somehow bounds the waves to a limited domain, forcing them to interact forever".

Therefore, while we agree with the referee that coastal Kelvin waves might appear in the non-linear and long term evolution of the coastal flow, as shown in GZB10 for a two-layer configuration, we believe that the complete analysis of their formation in our continuously stratified configuration is beyond the scope of this paper.