



On the dynamics of alternating zonal jets in oceans

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A possible mechanism for the formation of alternating zonal jets that have recently been observed in the world oceans is the anisotropization of the two-dimensional (2D), turbulent, inverse-cascade of energy. Although this mechanism has been studied extensively in the contexts of 2D turbulence and the banded structure of Jovian atmospheres, a lack of zonal symmetry in the oceanic context is suspected to render specifics of such a mechanism different. We present, for the first time, computational evidence of alternating zonal jets in a closed basin, within the framework of the barotropic vorticity equation and then verify scaling of jet-width with Rhines' scale. This demonstrates that inasmuch as this mechanism is relevant to the ocean and atmospheres, the dynamics of alternating zonal jets in the two contexts can be similar and that certain recently proposed mechanisms involving basin modes may not be necessary to explain the formation of zonal jets in a closed basin