



Interaction between geostrophic and near-inertial motion in a recirculating channel

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At low Rossby number, slowly varying balanced flows influence faster timescale unbalanced motion, but unbalanced motion is thought to have little affect on the background geostrophic flow. At moderate Rossby number, this lack of influence is less clear. In this work, we focus on interactions between the geostrophic flow and the near-inertial wave field. We consider wind-driven flow in primitive equation simulations of a zonally periodic channel forced by a combination of steady and high frequency (near-inertial) forcing. The high frequency forcing excites energetic near-inertial motion, and our focus is on how the addition of this unbalanced flow influences the low frequency (and ostensibly balanced) part of the flow. In particular, we seek to clarify situations under which interaction with near-inertial motion can lead to exchanges that remove energy from the low frequency flow, evaluate the size of this sink, and assess its influence on the overall flow in the channel.