

Modified View of Barotropic Energy Conversion and its Application to the Kuroshio extension region

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The Lorentz diagram is one of the simplest methods to estimate eddy-mean flow interactions. The 6-box Lorentz diagram is considered to deal with non-local interactions. However, the modified one include "the interaction energy flux", whose physical interpretation is vague. In this presentation, the interaction energy flux is shown to be the energy transfer through eddy-mean flow interactions. Moreover, we apply the modified diagram to the Kuroshio extension region to analyze the role of eddy-mean flow interactions. The interaction energy flux indicates that eddy-mean flow interactions transport the total kinetic energy from upstream to downstream and converted to the mean flow energy corresponding to the energy conversion rate. This result shows eddy-mean flow interactions deaccelerate(accelerate) the Kuroshio Extension jet in the upstream(downstream) region.

Keywords: The Lorentz diagram, eddy-mean flow interactions, The Kuroshio extension