Geophysical Research Abstracts
Vol. 20, EGU2018-6439, 2018
EGU General Assembly 2018

A generalized action-angle representation of wave interaction in stratified shear flows

Eyal Heifetz (1) and Anirban Guha (2)

(1) Tel-Aviv University, Geophysics and Planetary Sciences, Tel-Aviv, Israel (eyalh@post.tau.ac.il), (2) Department of Mechanical Engineering, Indian Institute of Technology, Kanpur, India

In this work we express the linearized dynamics of interacting interfacial waves in stratified shear flows in the compact form of action-angle Hamilton's equations. The pseudo-energy serves as the Hamiltonian of the system, the action coordinates are the contribution of the interfacial waves to the wave action and the angles are the phases of the interfacial waves. The term 'generalized action angle' aims to emphasize that the action of each wave is generally time dependent and this allows for instability. An attempt is made to relate this formalism to the action at a distance resonance instability mechanism between counter-propagating vorticity waves via the global conservations of pseudo-energy and pseudo-momentum.