Beitrag ID: **34** Typ: **Oral**

The Balance Conundrum

Freitag, 12. April 2024 11:50 (20 Minuten)

Atmosphere and ocean dynamics are dictated by balanced flows, such as mesoscale eddies, but determining a precise balanced state remains challenging in the presence of its nonlinear coupling with the unbalanced flows, such as internal gravity waves. This results in nonlinear internal wave generation by spontaneous loss of balance, that challenges the conundrum of the existence of an invariant balanced state from a mathematical perspective, and at the same time has physical implications for the energy cycle of the atmosphere and ocean.

In this talk, I will discuss the recent progress in deriving and quantifying the balanced state in geophysical flows from nonlinear flow decomposition. This is applied to varied oceanic regimes to quantify wave generation from spontaneous loss of balance and assess its role in the energy cycle and in the balance conundrum. Further, to diagnose these processes in complex flows, a new flow decomposition approach is presented for realistic applications, such as flows with boundaries. These developments provide new avenues to determine the balanced state and offer fresh insights into the atmosphere and ocean dynamics, that are central to understand the dynamics of the climate.

Hauptautor: CHOUKSEY, Manita (Leibniz Institut for Ostseeforschung Warnemünde (IOW))

Vortragende(r): CHOUKSEY, Manita (Leibniz Institut for Ostseeforschung Warnemünde (IOW))

Sitzung Einordnung: Conference