Near-inertial waves modulated by background flows in realistic global ocean simulations

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Goal: To understand how depth-integrated NIW energetics for the undecomposed fields and the fields decomposed into vertical normal modes are modulated by background flows in **global** HYCOM simulation.

- All horizontal propagation is captured in the first 5 modes.
- Horizontal fluxes diverge from cyclones and converge in anticyclones (Fig 1a).
- *KE* is enhanced in anticyclones (Fig 1b).
- Residual energy (Δ*KE*) is trapped in anticyclones where it propagates downward to the ocean interior (Figs 1c & 2).

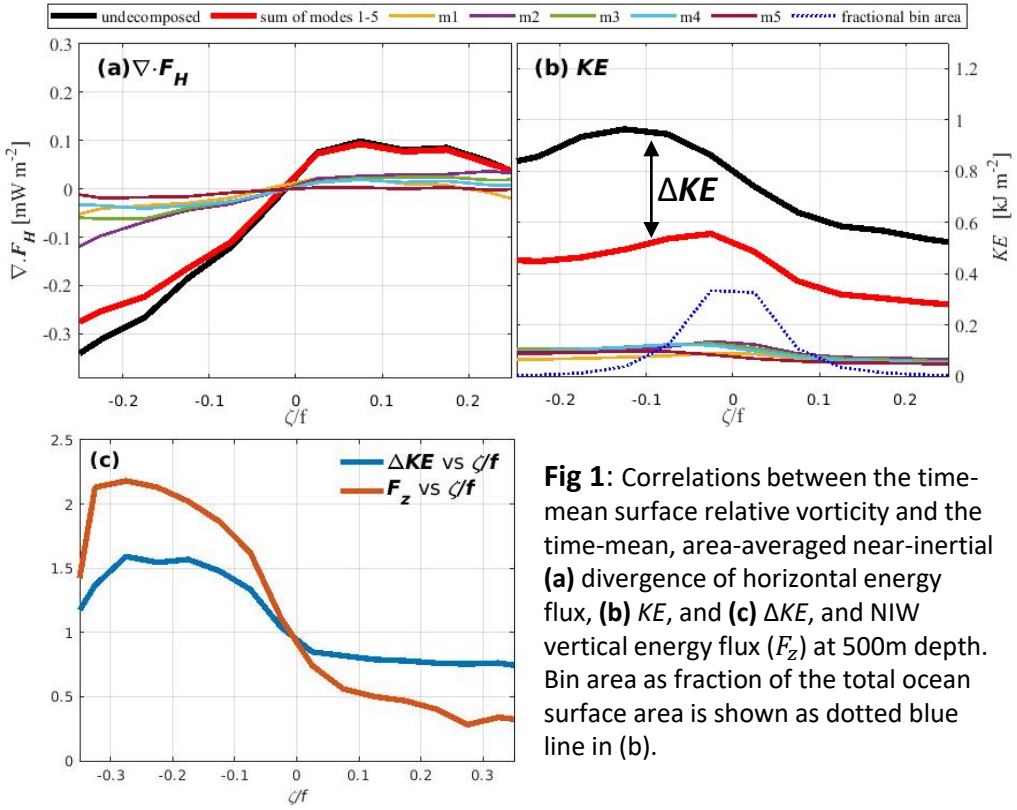

Fig 1: Correlations between the time-mean surface relative vorticity and the time-mean, area-averaged near-inertial **(a)** divergence of horizontal energy flux, **(b)** *KE*, and **(c)** Δ*KE*, and NIW vertical energy flux (F_z) at 500m depth. Bin area as fraction of the total ocean surface area is shown as dotted blue line in (b).

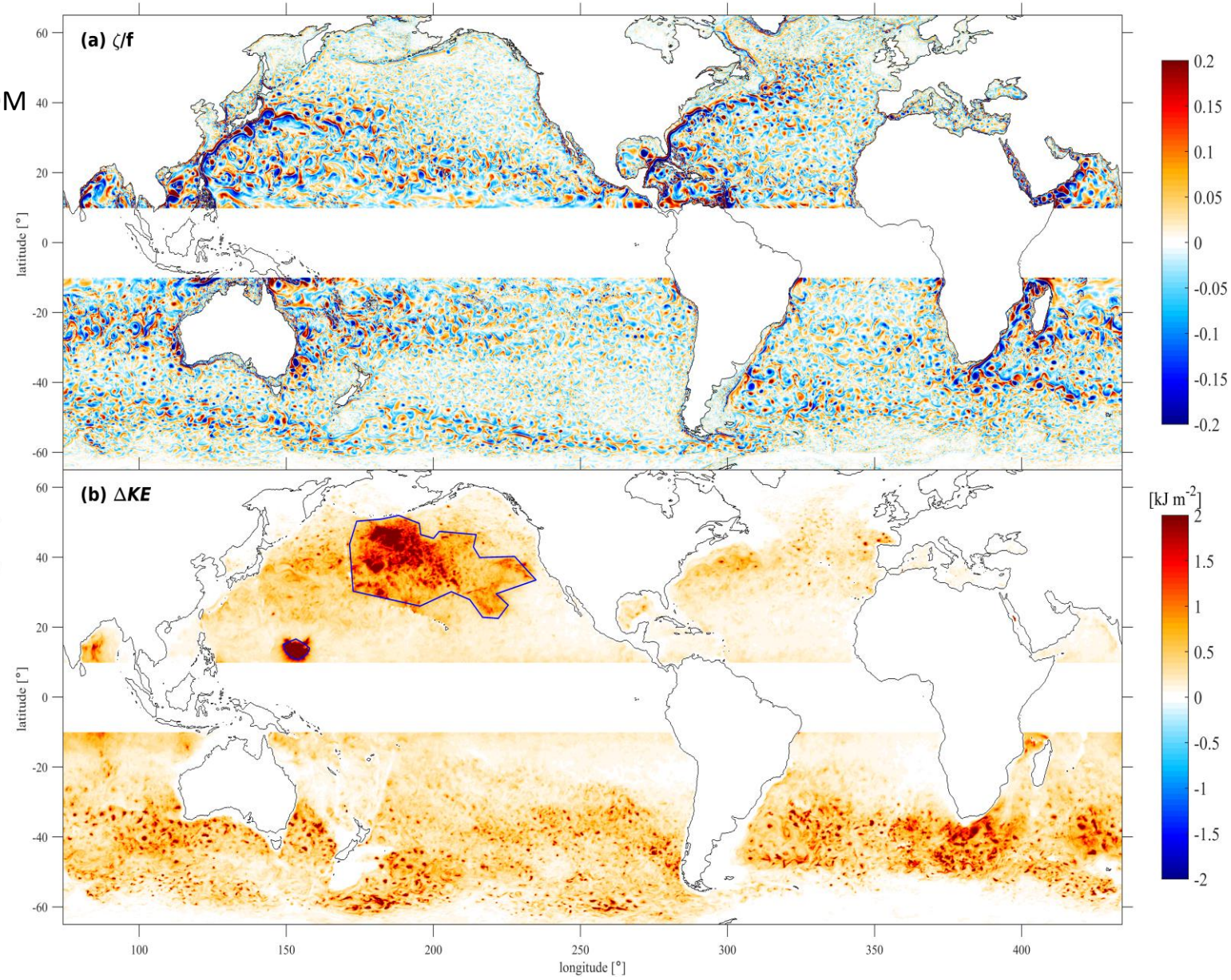

Fig 2: Time-mean **(a)** surface relative vorticity, and **(b)** depth-integrated Δ*KE*