A new equation for the inversion of Ertel's potential vorticity to be used for the model diagnosis of group-velocity-based energy flux associated with waves at all latitudes

Aiki, Takaya and Greatbatch (2015, JAS)

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Auto-focus for all waves
Seamless at all latitudes

A new 3D inversion equation for EPV in a continuously stratified fluid

\[
\nabla f + \nabla \varphi + \frac{\partial}{\partial z} \left[ \frac{f^2 - 3\nu_b^2}{N^2} \frac{\partial \varphi}{\partial z} \right] = \rho_z (f + u_x - u_y - \rho_x v_z + \rho_y u_z) - f
\]

Fourier decomposition at each point in horizontal space

repeat EPV inversion to cover all frequency bands

Aiki, Takaya and Greatbatch (2015, JAS)