Generation and backreaction of spontaneously emitted inertia-gravity waves -An update of the ocean energy budget-

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Spontaneous generation of inertia-gravity waves from balanced flows is investigated in idealized simulations of dipoles. Long integrations are performed for dipoles with different Rossby numbers (Ro) to identify the backreaction of the waves. Emission of waves is detected only for large enough Ro (>0.15), and it then leads to a slow decay of the dipole's kinetic energy. A major finding is that this decay is well captured by the simulations, although positions of the waves appear still sensitive to the resolution, and their maximum vertical velocity increases linearly with resolution. The interpretation is that the emission process is well resolved and fairly insensitive to resolution, while the propagation and dissipation at small scales remains sensitive to resolution. The implication is that the simulations yield an estimate of the leakage of energy from balanced motions to gravity waves, providing a useful estimate of a poorly constrained flux in the ocean's energy budget.

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