Slow manifolds in rotating fluid flow

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I will introduce the concept of a slow manifold in the context of inviscid fluid flow and explain how this gives rise to a nonlinear decomposition of the flow into a "balanced motion" and inertia-gravity waves. Moving to simpler finite-dimensional systems, I will explain how these manifolds can be characterized computations by so-called "optimal balance", and show how loss of balance is linked to singularities in the complex plane of the balanced motion.