



THE EXPLODING VORTEX PAIR
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In these photographs we show visualizations of the evolution of a vertical vortex pair in a *vertically stratified* fluid. In contrast to the case of a vortex pair in a homogeneous fluid, the well known long-wavelength instability^{1,2} is inhibited due to the stratification. Following a small-scale instability of the two elliptic vortices (above a critical Reynolds number),³ the strength of the primary vortices is such that the vortex pair relaminarizes. It is at this point that a further phenomenon occurs, as illustrated here. The vortices are generated from computer-controlled and hinged vertical flaps.

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Visualization of the vortex pair is by laser-induced fluorescence in a salt-stratified tank.

Our view of the vortex pair from above appears to develop in the classic manner and then to depart from this form dramatically, as shown in the large photograph on the left. The different horizontal segments of the vortex pair move apart in what appears to be layers and, when viewed from above, it gives the appearance of the vortex pair “exploding” in different directions. In its most organized form, the vertical pair of vortices develops an antisymmetric waviness, which is seen developing in the two photos on the right, when the vertical pair is coming towards us. The inhibition of the Crow long-wavelength instability, due to the presence of stratification, and the antisymmetric instability of the relaminarized vortices, are new observations.

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