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Downstream and soaring interfaces and vortices in 2D stratified wakes and their impact on transport of contaminants

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We study numerically and experimentally upstream effects and downstream wake past different obstacles (transverse and sloping strips, cylinders, wings, bluff bodies). We have distinguished transient and attached (lee) internal waves, downstream wakes with submerged interfaces and vortices, soaring singular interfaces, soaring vortices and vortex systems. We visualized fine transverse streaky structures past horizontally towing strip and studied formation of streaky structures clusters and their transformation into vortex systems. We constructed 3D cube of regimes, including listing of large-scale regular and small-scale singular components. Formation of internal boundary layers and vortices affect redistribution of density clouds. Comparisons laboratory data with numerical visualizations and some environmental phenomena including oil spills and volcanic ash plumes transport are done.