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Interleaving intrusions between adjacent layered stratifications[1]
BENJAMIN MAURER, Scripps Institution of Oceanography, PAUL LINDEN, DAMTP, University of Cambridge — Interfacial gravity currents occur when horizontal density gradients result in the intrusion of a fluid along the interface between two layers of ambient fluid. This system has traditionally been studied in the case where the ambient fluid consists of only two layers, however, many oceanographic and atmospheric flows involve the interleaving adjacent stratifications consisting of multiple layers. We present an experimental and numerical study of the interleaving of multiple interfacial intrusions propagating in both directions. For the simple case of two adjacent layered stratifications where the average density of both sides is equivalent, the adjacent layers interleave at uniform speeds. However, if the average density of one side is increased, the individual current speeds show a marked departure from the speeds predicted from local initial conditions. We present a model to account for this departure.

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