

Monaghan, J. J.

Gravity current interaction with interfaces. (English) [Zbl 1296.76013](#)

Davis, Stephen H. (ed.) et al., Annual review of fluid mechanics. Vol. 39. Palo Alto, CA: Annual Reviews (ISBN 0-8243-0739-9/hbk). Annual Review of Fluid Mechanics 39, 245-261 (2007).

Summary: Gravity currents that impact interfaces have a number of features that differ from gravity currents in homogeneous or continuously stratified ambient fluid. The interface can cause sharp changes in the flow and split the current into an undercurrent in the dense layer and a filling intrusion in the upper layer. If the current penetrates the lower layer it can initiate large amplitude waves with a length scale several times larger than the scale of the head of the current. If the current carries particulate matter the change in flow at the interface changes the deposition of particles. Because approximate two-layer systems exist in nature, especially in basins ranging up to the size of the Arctic, and may affect global climate, further experiments are needed to clarify the entrainment and mixing of the ambient fluid with the current. Comprehensive, and accurate, numerical simulations of these flows should now be possible.

For the entire collection see [\[Zbl 1106.76006\]](#).

MSC:

- 76B10** Jets and cavities, cavitation, free-streamline theory, water-entry problems, airfoil and hydrofoil theory, sloshing
- 76B70** Stratification effects in inviscid fluids
- 76-02** Research exposition (monographs, survey articles) pertaining to fluid mechanics

Cited in **6** Documents

Keywords:

density currents; interfacial flows; entrainment; filling basins