

Abstract Submitted
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Power-law for gravity currents produced from instantaneous sources propagating on inclined boundaries in the deceleration phase¹

ALBERT DAI, Tamkang University — The power-law for gravity currents on slopes is essentially an equivalent form of the solution of thermal theory, when the gravity current is sufficiently far into the deceleration phase. However, the hypothesis that gravity current is sufficiently far into the deceleration phase is hardly satisfied in experiments. In this paper, we re-derived the power-law, considering the influence of bottom friction, and corrected an error in an early version of power-law given by Maxworthy (2010). When the gravity current is not sufficiently far into the deceleration phase, we showed that the power-law still robustly describes the front location versus time relationship, but the amount of heavy fluid in the head can be easily underestimated. The underestimation of heavy fluid in the head also depends on where the gravity current is in the deceleration phase. Therefore, a correction factor is suggested according to the location of gravity current.

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