



Estimation of Friction Parameters and Laws in 1.5D Shallow-Water Gravity Currents on the f-Plane, by Data Assimilation

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A 1.5 dimensional, 1.5 layer shallow water model and an ensemble Kalman filter are used to evaluate the feasibility of estimating friction parameters and determining friction laws of oceanic gravity currents. The two friction laws implemented are a linear Rayleigh friction and a quadratic drag law. We demonstrate that the assimilation procedure rapidly estimates the total frictional force whereas the distinction between the two laws is evolving on a slower time scale.

We also demonstrate that, parameter estimation can in this way choose between different parametrisations and help to discriminate between physical laws of nature by estimating the coefficients presented in such parametrisations.