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Gravity effects on the nonlinear dynamics of premixed flames CHRISTOPHE ALMARCHA, BASILE RADISSON, BRUNO DENET, Aix Marseille Universit, CNRS, Centrale Marseille, IRPHE UMR 7342, 13384 Marseille, France — During their propagation, premixed flames are unstable and undergo a rich dynamics that can be favorably compared to the integration of Michelson-Sivashinsky (MS) equation. Three main ingredients are involved in this nonlinear partial differential equation : the Darrieus-Landau non local instability, the normal propagation of the front and a small scale diffusive stabilization. In order to take into consideration the long range effects of gravity, we study a modified (MS) equation where a linear stabilizing term is added. We demonstrate that this modified equation is capable of reproducing features of experimental 2D flames propagating downwards in a Hele-Shaw burner. In particular, although the additional term is linearly stabilizing, it is reponsible for an increase in the fragmentation of the interface into smaller cells.

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