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Collision of almost parallel vortex filaments

We investigate the occurrence of collisions in the evolution of vortex filaments through a system introduced by Klein, Majda and Damodaran and by Zakharov. We first establish rigorously the existence of a pair of almost parallel vortex filaments, with opposite circulation, colliding at some point in finite time. The collision mechanism is based on the one of the self-similar solutions of the model, described in our previous work. We also extend this construction to the case of an arbitrary number of filaments, with polygonal symmetry, that are perturbations of a configuration of parallel vortex filaments forming a polygon, with or without its center, rotating with constant angular velocity. This is a joint work with Erwan Faou and Evelyne Miot.