

4. Reconnection of vortices

Reconnections of vortex filaments

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Abstract. The process of break-down and reconnection of vortex filaments is considered by the method of three-dimensional vortex singularities (vortons) in various situations, including oblique interaction of a vortex ring with a boundary in shear flow, shedding of a vortex ring from a horseshoe vortex, instability of elliptic vortex ring, Crow instability of two perturbed antiparallel vortex filaments, merging and subsequent splitting of vortex rings. Special attention is paid to the global integrals (vorticity, momentum, angular momentum) and to the inviscid dissipation of energy. The visualization of the effective vortex core, created by the interference of the vorticity fields of vortons, is presented. The comparisons with other methods of simulation of three-dimensional vortex interactions and with the observations have been made.