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Search for Euler Singularity using Vortex Filaments SAHAND HORMOZ, MICHAEL BRENNER, Harvard University — A promising mechanism for generating a finite-time singularity in the incompressible Euler equations is stretching of vortex filaments. An exhaustive search of all possible initial conditions involving filaments, however, is not practically feasible. In this talk, I will show that two interacting vortex filaments can not generate a singularity for any initial conditions, by analyzing the asymptotic self-similar limit of their collapse. Essentially, our approach entails a separation of the dynamics of the filament shape, from the shrinking of its core. We solve for the dynamics using a self-similar ansatz and show that the core does not shrink fast enough for a self-consistent collapse. The similarity solution allows for many different collapse geometries, consistent with the tireless effort in the past of investigating new initial conditions. Potential for a singularity at higher number of filaments is also discussed.

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