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**Local Stability Analysis of Fat Vortex Rings** YUJI HATTORI, Tohoku University, KEISUKE HIJIYA, Kyushu Institute of Technology — The stability of fat vortex rings is studied by the geometrical optics method. It is found that Hill's vortex is subject not only to the elliptical instability but also to the curvature instability, which is due to the curvature of vortex tubes and first found for the vortex ring with thin core. A new type of instability is also found; it is a coupled mode of the elliptical and curvature instabilities. The strongest instability is the elliptical instability for a wide area of the vortex, while the coupled instability surpasses the elliptical instability near the surface. The effects of swirl on the instability are investigated. The maximal growth rate becomes small as the magnitude of swirl becomes large.

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