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Universality of the anomalous enstrophy dissipation at the collapse of three point vortices on Euler-Poincaré models TAKESHI GOTODA, Hokkaido university, TAKASHI SAKAJO, Kyoto university — Anomalous enstrophy dissipation of incompressible flows in the inviscid limit is a significant property characterizing 2D turbulence. It indicates that the investigation of non-smooth incompressible and inviscid flows contributes to the theoretical understanding of turbulent phenomena. In the preceding study, we have considered weak solutions to the Euler-α equations, which is a regularized Euler equations, for point-vortex initial data and shown that the evolution of three point vortices converges to a self-similar collapsing orbit dissipating the enstrophy at the critical time as $\alpha \to 0$. In order to elucidate whether or not this singular orbit can be constructed independently on the regularization method, we considered a functional generalization of the Euler-α equation, called the Euler-Poincaré models. We provide a sufficient condition for the existence of the singular orbit. As examples, we confirmed that the condition is satisfied with the Gaussian regularization and the vortex-blob regularization. Consequently, the enstrophy dissipation via the collapse of three point vortices is a generic phenomenon that is not specific to the Euler-α model but universal within the Euler-Poincaré models.

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