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Scaling properties towards vortex reconnection under Biot-Savart evolution YOSHIFUMI KIMURA, Nagoya University, KEITH MOFFATT, University of Cambridge — Reconnection of two vortex filaments under the Biot-Savart law is investigated numerically using vortex filaments in the configuration of tilted hyperbolae initially. For the numerical method, the vortices are divided into piecewise linear segments with an initial coordinate stretching by the double exponential formula, and the Biot-Savart integral is approximated by a summation over the segments with a cut-off method to deal with the singular terms. It is demonstrated that the centre parts of the hyperbolae tend to approach and accelerate to form a singularity. Even though the minimum separation of the hyperbolae, the maximum velocity and the maximum axial strain rate show clear scaling exponents close to the singularity of Leray type, the latter two exponents are slightly more singular to cause a production of inflection points and eventually cusp structures at the tips [1]. As a validation of the model, λ_2, the second eigenvalue of the rate of strain tensor, is investigated around the vortices. It is shown that λ_2 takes negative values near the tip of the vortices for almost all the time. [1] Y. Kimura & K. Moffatt, Scaling properties towards vortex reconnection under Biot-Savart evolution. (2017), *Fluid Dyn. Res.* in press.

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