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Initial conditions for reconnection calculations of quantized vortices CECILIA RORAI, Università degli Studi di Trieste - University of Maryland, DANIEL P. LATHROP, MICHAEL E. FISHER, University of Maryland, KATEPALLI R. SREENIVASAN, New York University — Vortex reconnection occurs when two vortices intersect and then rejoin with exchanged tails. This process occurs in both classical fluids and superfluids, in superconductors, and in magnetized plasmas. In helium II this phenomenon has been investigated numerically via the Gross-Pitaevskii equation. Although a simplified model, the Gross-Pitaevskii equation is interesting since it naturally embodies vortex reconnection, as first numerically shown by Koplik & Levine [Phys. Rev. Lett. 71, 1375 (1993)]. A crucial issue in such computations is the selection of initial conditions. The question we address is how initial wave functions may effect the outcome of reconnection. Traditionally the initial conditions have been generated by multiplying approximate wave functions for a single vortex and imposing, to some degree, periodic boundary conditions. An alternative approach will be presented. It consists in selecting an initial configuration that minimizes the total energy. The differences between the results obtained with this approach and previous ones will be discussed especially with respect to the dispersion of energy seen in quantum turbulence.

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