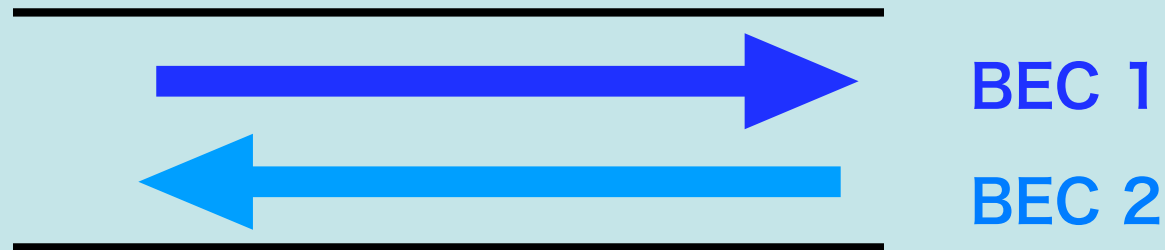


Binary quantum turbulence arising from countersuperflow instability in two-component BECs

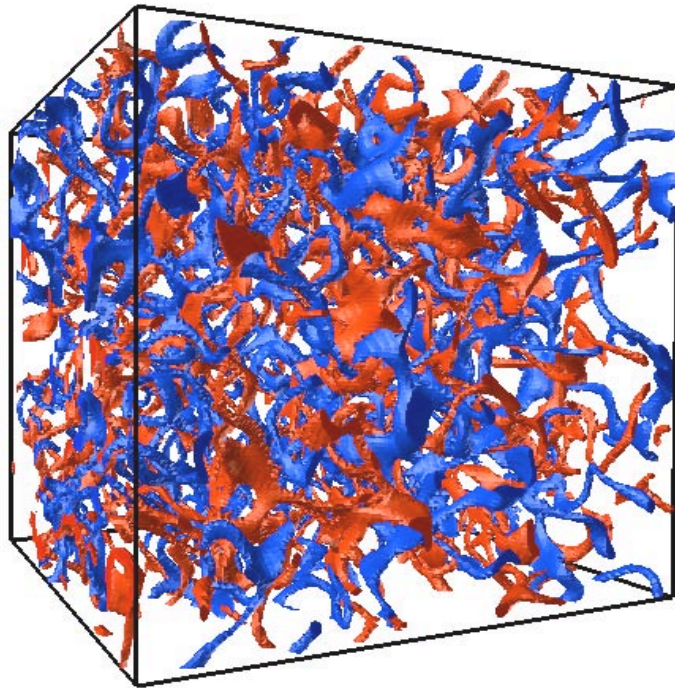
H. Takeuchi, S. Ishino, M. Tsubota, PRL105, 205301(2010)

Counterflow of two-component miscible BECs



When the relative velocity exceeds some critical value, two BECs are expected to become unstable and turbulent.

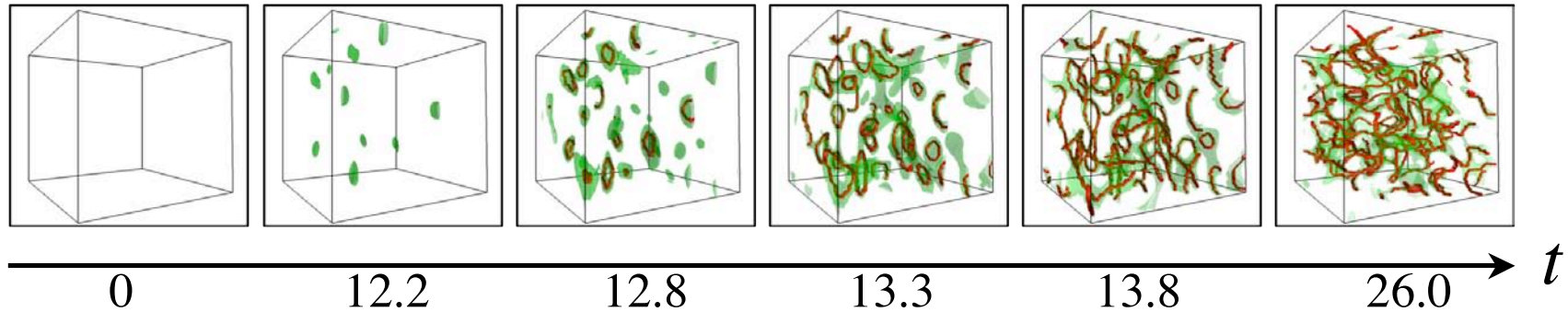
3D 2-component QT



Flow direction

1. Dynamical instability causes disk-shaped solitons.
2. Vortex loops appear from the solitons.
3. The vortices expand through lots of reconnections to develop to binary QT.

✓ Scenario to turbulence



momentum exchange

As vortices grow, two BECs start to exchange momentum to reduce their relative velocity. It is a sort of “mutual friction”.

