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Dynamics of Ginzburg-Landau and Gross-Pitaevskii vortices on manifolds

Abstract. In this talk we consider the dissipative heat flow and conservative Gross-Pitaevskii dynamics associated with the Ginzburg-Landau energy posed on a 2-manifold. We will show that in the $\varepsilon \rightarrow 0$, the vortices of the solution to these two problems evolve according to the gradient flow and Hamiltonian point-vortex flow respectively, associated with the renormalized energy. For the heat flow on a sphere, we will also present an annihilation result for the limiting system of ODE's.