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Walter Craig* (craig@math.mcmaster.ca), Department of Mathematics & Statistics, McMaster University, Hamilton, Ontario L8S 4K1, Canada. *Near-parallel vortex filament dynamics.*

Over the past decade and more, techniques have been developed for the phase space analysis of the dynamics of many model nonlinear Hamiltonian PDEs. In this talk I will describe some extensions of these ideas to a problem in fluid dynamics concerning the interaction of two near-parallel vortex filaments in three dimensions. In addition, as well as generalizations of this problem, I will give a number of promising directions of study and further applications of the techniques of Hamiltonian PDEs to other nonlinear systems of fluid dynamics, in the form of a class of nonlinear evolution problems of physical significance. (Received September 24, 2012)