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Thomas A. Ivey* (iveyt@cofc.edu). *Integrable Geometric Evolution Equations for Curves*.
Preliminary report.

The vortex filament flow and the ‘planar filament flow’ are *geometric* evolution equations for curves because they commute with Euclidean isometries. These flows also induce completely integrable PDE for curvature and torsion: the focussing nonlinear Schrodinger equation and the mKdV equations, respectively. It is not known if these two examples—with their commuting flows of higher order—are the only geometric flows which are completely integrable in this sense.

I will describe an approach for classifying all such equations, based on the existence a generalized symmetry of arbitrarily high order. (This approach overlaps with that used by Mikhailov *et al.* to classify certain scalar evolution equations.) The first steps of this classification, carried out with help from Ian Anderson and Mark Fels, have lead to new examples of integrable hierarchies of flows for planar curves and for curves in three dimensions. I will discuss conservation laws, recursion operators, special solutions, and geometric interpretations for these new flows. (Received November 19, 2000)