1085-65-34 **Yu-Min Chung*** (yumchung@indiana.edu), Rawles Hall, 831 E. 3rd St., Bloomington, IN 47404, and **M.S. Jolly**. *On the computation of foliations and tracking initial conditions for differential equations.*

The Hartman-Grobman Theorem provides a local foliation for an ODE near a hyperbolic point; through all nearby points there are a pair of leaves that define a conjugacy to the linearized flow. In the classic case one leaf passing through the hyperbolic point is its unstable manifold, the other its stable manifold, both of which are invariant. In general the leaves are not invariant. They can, however, be characterized by the exponential growth/decay rates of the differences between solutions that start on them. If the gap in the spectrum of the linear part sufficiently dominates the Lipschitz condition of the nonlinear part in a large enough neighborhood, and the spectrum is positioned properly, the unstable manifold is an inertial manifold. Each solution is attracted at an exponential rate to a particular "tracking" solution on the inertial manifold. We present several algorithms for the accurate computation of the leaves in the foliation and as well as for the tracking initial condition for a given solution. The algorithms are demonstrated on the Kuramoto-Sivashinsky equation. (Received August 10, 2012)