John K Hunter* (jkhunter@ucdavis.edu), Department of Mathematics, University of California at Davis, Davis, CA 95616, and Mihaela Ifrim, Department of Mathematics, University of California at Davis, Davis, CA 95616. Enhanced Lifespan of Smooth Solutions of a Burgers-Hilbert Equation.

We consider an initial value problem for an inviscid Burgers-Hilbert equation that models the motion of vorticity discontinuities in the two-dimensional flow of an inviscid, incompressible fluid. We use a normal form transformation, consisting of a near-identity transformation of the independent spatial variable, to remove the quadratic nonlinearity and prove the existence of small, smooth solutions on cubically nonlinear time-scales. For vorticity discontinuities, this result means that there is a cubically nonlinear time-scale before the onset of filamentation. (Received September 22, 2011)