Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Complex dynamics in simple models of shear banding SUZANNE FIELDING, School of Mathematics, University of Manchester, HELEN WILSON, Department of Mathematics, University College London, PETER OLMSTED, School of Physics and Astronomy, University of Leeds — Complex fluids commonly undergo flow instabilities and flow-induced transitions that result in spatially heterogeneous "shear banded" states. Often, these banded states display oscillatory or chaotic dynamics, measured in the bulk rheological signals and in the motion of the interface between the bands. Until recently, however, theory predicted a steady state comprising stationary bands separated by a flat interface. We discuss recent theoretical progress in capturing complex dynamics of the banded state: first in a model in which the interface (or interfaces) remains flat but moves in a chaotic way; second in a model that explicitly allows for undulations along the interface.

Suzanne Fielding
School of Mathematics, University of Manchester

Date submitted: 14 Nov 2005 Electronic form version 1.4