Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Interaction of solitary pulses in active-dispersive media SERGEY SAPRYKIN, DMITRI TSELUIKO, SERAFIM KALLIADASIS, Department of Chemical Engineering, Imperial College London — We develop a coherent structures theory for solitary pulses in active media with energy supply, dissipation, dispersion and nonlinearity, such as a film falling down a planar substrate. The overall profile is written as a superposition of the pulses and an overlap function. By projecting the dynamics of this function onto the zero modes of the eigenvalue problem that governs the interaction we obtain dynamical system for the location of the pulses. We show that for the generalized Kuramoto-Sivashinsky equation, in particular, it is necessary to solve a generalized eigenvalue problem due to the nature of the nonlinearity. As a consequence, the underlying dynamical system is a two-dimensional one. We examine the influence of dispersion onto the seperation distance of equilibrium pulses and we contrast the theoretical predictions with statistical data from time-dependent computations.

Serafim Kalliadasis
Department of Chemical Engineering, Imperial College London

Date submitted: 17 Sep 2008 Electronic form version 1.4