Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Autoresonant Excitation and Control of Multiphase Nonlinear Waves[1] LAZAR FRIEDLAND, Hebrew University of Jerusalem — Plasmas and fluids are examples of extended systems described by nonlinear differential equations possessing many nontrivial solutions. The question of reaching and controlling a particular stable solution (pattern) in this set of solutions by starting from simple initial/boundary conditions is fundamental to many applications. A general recent approach to nonlinear pattern formation is based on capturing the system into resonance with slow external perturbations followed by a continuing self-synchronization (autoresonance) in space and/or time. Applications of this paradigm exist in vorticity dominated flows, plasmas, planetary dynamics, atomic and molecular physics. The synchronization means excursion in the system solutions space with possible emergence of the desired nonlinear state. I will describe new developments in the field and recent applications to excitation of multiphase nonlinear waves in the Korteweg-de-Vries and nonlinear Schrodinger systems.

[1]Supported by U.S.-Israel Binational Science Foundation (Grant No. 2004033)

Lazar Friedland
Hebrew University of Jerusalem

Date submitted: 19 Jul 2005 Electronic form version 1.4