Diffusion Mediated Transport with a Look at Motor Proteins

Stuart Hastings
Department of Mathematics
University of Pittsburgh
Pittsburgh, PA 15260
email: sph+@pitt.edu

David Kinderlehrer
Department of Mathematical Sciences
Carnegie Mellon University
Pittsburgh, PA 15213
email: davidk@cmu.edu

Bryce McLeod
Department of Mathematics
University of Pittsburgh
Pittsburgh, PA 15260
mcleod@pitt.edu

Abstract: In this note we discuss transport properties of weakly coupled parabolic systems of evolution equations. These arise in the study of molecular motors, like conventional kinesin, which are re sponsible for eukaryotic intracellular transport. It falls under the rubric of what we call diffusion mediated transport. Diffusion mediated transport generally concrns directed transport or oriented fluctuations of a system with a high degree of randomness and requires special collaboration among its various elements to achieve. We discuss how this plays out in multiple state systems.