Two Dimensional Fluid Flow in a Barred Galaxy Potential

LEE CULVER, GARY HUNTER, JAMES ESPINOSA, JULIE TALBOT, University of West Georgia, PAUL FISHER, JAMES WOODYARD, West Texas A&M University — We describe two-dimensional models for near-steady state gas flow in a bar potential. Such models serve as a first step in describing the thin disks of barred galaxies. Realistic three-dimensional models of barred galaxies remain a challenge to existing theory and so we proceed by thoroughly testing our tools in limited cases as we increase the complexity of the model. Our model begins with a steady-state solution of the hydrodynamic equations based upon the Hachisu Self-Consistent Field Technique and compares the resulting motions of the gas to that of stars determined by traditional integrations.