1069-65-222   **Hailiang Liu**, Ames, IA 50010, and **Hui YU*** (`legendyu@iastate.edu`), Ames, IA 50010. *AN ENTROPY SATISFYING METHOD FOR THE FOKKER-PLANCK EQUATION OF FENE DUMBBELL MODEL FOR POLYMERS.* Preliminary report.

In this paper, we present a novel entropy satisfying method to solve the Fokker-Planck equation of FENE dumbbell model for polymers. The method applies to both one dimensional and two-dimensional models with deformation induced by homogeneous fluids. Both semi-discrete and fully discrete schemes satisfy all three desired properties: i) mass conservation, ii) positivity preserving, and iii) entropy diminishing in time. These ensure that the computed solution is a probability density, and the solution converges to equilibrium as time evolves. Zero-flux at boundary is naturally incorporated, and boundary behavior is resolved sharply. Both one and two-dimensional numerical results are provided to demonstrate the good qualities of the scheme, as well as effects of some canonical homogeneous flows. (Received January 24, 2011)