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Xiaofan Li* (lix@iit.edu), E1-208, 10 W 32nd St, Chicago, IL 60616, and **Allen Flavell, Bob Eisenberg** and **Chun Liu**. *A conservative finite difference method for PNP equations*. Preliminary report.

PNP or drift diffusion equations models the motion of the ionic flow in media and solvents and transport in semiconductor devices. We present a finite difference method that preserves the total amount of each ionic species in time perfectly. Using numerical examples, we also demonstrate the conservation property is important in finding the equilibrium solutions to the corresponding steady-state equations (Poisson-Boltzmann equations). (Received February 08, 2012)