1106-78-578 **Duc D Nguyen*** (ddnguyen2@crimson.ua.edu), Tuscaloosa, AL 35401, and **Shan Zhao**, University of Alabama. *High order FDTD methods for electromagnetic systems in dispersive inhomogeneous media.*

Dispersive media are often encountered in the nature such as in rock, soils, plasma and biological tissues. The study of dispersive materials is, therefore, crucial to a wide range of electromagnetic applications. For instance, the ground penetrating radar (GPR) and microwave imaging for early detection of breast cancer are involved in dealing with dispersive soil and dispersive tissue respectively. In such media, the permittivity is known to be a function of frequency so that a broadband electromagnetic wave will propagate in a frequency dependent manner. The auxiliary differential equations (ADE) are employed to track the transient changes of field regularities across the dispersive interfaces. Novel finite-difference time-domain (FDTD) algorithms based on the matched interface and boundary (MIB) method are constructed to rigorously enforce the time-dependent jump conditions. High order convergences are numerically achieved in solving dispersive interfaces with complex shapes. (Received September 02, 2014)