

Abstract Submitted  
for the DPP09 Meeting of  
The American Physical Society

**Full scale quasi-static modeling of the PWFA-based linear collider concept**<sup>1</sup> CHENGKUN HUANG, W.-M. AN, C. CLAYTON, C. JOSHI, W. LU, K. MARSH, W. MORI, UCLA, T. KATSOULEAS, Duke University, I. BLUMENFELD, M. HOGAN, N. KIRBY, T. RAUBENHEIMER, A. SERGI, SLAC, P. MUGGLI, USC — Plasma Wakefield Acceleration (PWFA) has been proposed as a possible way to reduce the size and cost of the next linear collider. The needs to faithfully simulate the drive beam evolution and the main beam dynamics in the future plasma-based linear collider using Particle-In-Cell codes are extremely challenging. However, the recent progress on the development of quasi-static model and the usage of massive parallel computing resources have enabled simulation studies of the near term PWFA experiments and for the conceptual designs of the next generation facilities in full details with realistic linear collider parameters and including necessary effects such as ion motion. The simulation needs for modelling the plasma-based advanced accelerator at the energy frontier is discussed and a path towards this goal is outlined. Results from full scale simulations that include all particles in real plasma will be reported.

<sup>1</sup>Work supported by DOE.

Chengkun Huang  
UCLA

Date submitted: 21 Jul 2009

Electronic form version 1.4