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**Low Temperature Collisional Plasma Simulation with a PIC-DSMC Method** PAUL S. CROZIER, Sandia National Laboratories, MATTHEW M. HOPKINS COLLABORATION, RUSSELL HOOPER COLLABORATION, POLLY L. HOPKINS COLLABORATION, STEVEN J. PLIMPTON COLLABORATION, ALAN B. WILLIAMS COLLABORATION — In this work we will present the current state of our low temperature plasma simulation code. Its target application regime is low temperature plasmas that straddle the non-continuum to continuum regime, specifically including collisional effects and chemistry. Of particular importance to us is that the code be production quality, applicable to industrial problems. In pursuit of that goal, our code is based on unstructured meshes, is massively parallel, and includes dynamic load balancing. Our plasma model consists of weighted particles for each constituent present (ions and neutrals of differing species, and electrons) coupled to an electrostatic (ES) field. The ES field is computed via the finite element method (FEM) every time step by aggregating particle charges on an element-by-element basis. Particles within an element interpolate the electric field to their position for use in the particle move algorithm. Thus, we are performing a very simple particle-in-cell (PIC) simulation. Subsequent to particle moves, collisions are accounted for via a DSMC method.

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