

Abstract Submitted  
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**DSMC Algorithms for Moving-Boundary Problems** J.R. TORCZYNSKI, M.A. GALLIS, Sandia National Laboratories — Direct Simulation Monte Carlo (DSMC) algorithms for problems with moving boundaries are investigated. The motivation is a microbeam that moves out-of-plane toward and away from a parallel substrate. For implementation and verification purposes, the simpler but analogous one-dimensional situation of a piston moving between two parallel walls is examined. Two moving-boundary algorithms are investigated. In the first algorithm, molecules are reflected rigorously from the moving piston by performing the reflections in the piston reference frame. In the second algorithm, molecules are reflected approximately by moving the piston and subsequently reflecting all molecules from the moving piston at its new or old position. The object moves over the mesh without deforming it in both algorithms. The two algorithms produce essentially identical results (except for noise) for a wide range of piston motions and for both specular and diffuse reflections. Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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