

Numerical Simulations of the Boltzmann Transport Equation for Applications in Microelectronics Manufacturing

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Abstract: Many manufacturing processes for microelectronics are characterized by the low pressure in the reaction chamber. For a large class of deposition and etching processes, a system of Boltzmann transport equations constitutes the appropriate model. A deterministic numerical method based on Galerkin ansatz in velocity space has been developed. This talk will present predictive simulation results for full 3-D/3-D models for complex spatial domains with surface reaction models for a variety of processes. The parallel implementation of the method scales well to more than 32 processors on a Beowulf cluster with a high-performance interconnect.