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Surface Growth Modeling of Load Balancing in Parallel Discrete Event Simulations (PDES)[1] POONAM VERMA, MARK NOVOTNY, Mississippi State University — We study a non-equilibrium surface growth model of load balancing for conservative Parallel Discrete Event Simulations (PDES) [Korniss et al., Science 299, **677** (2003); Guclu et al., Phys. Rev. E **73**, 066115 (2006)]. Load balancing improves the performance of the parallel simulations by distributing the work load over all processors evenly. These models for static load balancing are in the Kardar-Parisi-Zhang (KPZ) universality class, with the KPZ process often mixed with a Random Deposition (RD) process [Kolakowska et al., Phys. Rev. E **73**, 011603 (2006)]. We study how the utilization and the desynchronization behave when the load changes randomly during the simulation. We compare the static and dynamic load balancing results for the models of PDES. The underlying framework proposed in [L. N. Shchur and M. A. Novotny Phys. Rev. E **70**, 026703 (2004)], is that the Local Simulated time (LST) is associated with the nodes and not with the processing elements.

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