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Finite size scaling analysis on Nagel-Schreckenberg model for traffic flow ASHKAN BALOUCHI, DANA BROWNE, Department of Physics & Astronomy, Louisiana State University — The traffic flow problem as a many-particle non-equilibrium system has caught the interest of physicists for decades. Understanding the traffic flow properties and though obtaining the ability to control the transition from the free-flow phase to the jammed phase plays a critical role in the future world of urging self-driven cars technology. We have studied phase transitions in one-lane traffic flow through the mean velocity, distributions of car spacing, dynamic susceptibility and jam persistence -as candidates for an order parameter- using the Nagel-Schreckenberg model to simulate traffic flow. The length dependent transition has been observed for a range of maximum velocities greater than a certain value. Finite size scaling analysis indicates power-law scaling of these quantities at the onset of the jammed phase.

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