

TEMPLE UNIVERSITY
Department of Mathematics

Applied Mathematics and Scientific Computing Seminar

Room 617 Wachman Hall

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Non-Equilibrium Dynamics of Second Order Traffic

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Abstract. It is known that inhomogeneous second-order macroscopic traffic models can reproduce the phantom traffic jam phenomenon: whenever the sub-characteristic condition is violated, uniform traffic flow is unstable, and small perturbations grow into nonlinear travelling waves, called jamitons. In contrast, what is essentially unstudied is the question: which jamiton solutions are dynamically stable? This question is critical to understanding which stop-and-go traffic waves can arise through the dynamics of the model, and to deriving a reduced effective second-order model where the variables are averaged quantities.