

Abstract Submitted
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Development of kink jams in traffic flow DOUGLAS KURTZE, Saint Joseph's Univ — Near the threshold of absolute stability of uniform, steady traffic flow, car-following models can often be reduced to a modified Korteweg-deVries (mKdV) equation plus small corrections. The mKdV equation has a continuous family of hyperbolic-kink solutions describing boundaries between regions of different traffic densities, i.e. the edges of traffic jams. A solvability calculation picks out the one member of this family which is consistent with the correction terms; this is usually labelled the “selected” kink. This identification is problematic, however, since it must be the downstream boundary condition that determines which kink solution is realized. We display a two-parameter family of mKdV solutions which has the kink solutions as one limit and uniform flow as another, and show how the correction terms can lead to kinks developing from initially near-uniform traffic. We then clarify the meaning of the usual solvability calculation and of the “selected” kink.

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