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Mathematics > Analysis of PDEs

A Hamilton-Jacobi approach to junction problems and application to traffic flows

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This paper is concerned with the study of a model case of first order Hamilton-Jacobi equations posed on a "junction", that is to say the union of a finite number of half-lines with a unique common point. The main result is a comparison principle. We also prove existence and stability of solutions. The two challenging difficulties are the singular geometry of the domain and the discontinuity of the Hamiltonian. As far as discontinuous Hamiltonians are concerned, these results seem to be new. They are applied to the study of some models arising in traffic flows. The techniques developed in the present article provide new powerful tools for the analysis of such problems.

Comments:This paper is dedicated to J.-B. Hiriart-Urruty. Note on v3: to
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