NUMERICAL SOLUTION OF TRAFFIC FLOW MODEL ON NETWORKS

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ABSTRACT

Our work [1] describes the numerical solution of traffic flows on networks. We solve especially the macroscopic models. Using these models, it is possible to make simulations on big networks with lots of cars. These models are described by partial differential equations in the form of conservation laws.

For the numerical solution of our models, we use the discontinuous Galerkin method in space and a multistep method in time. The use of the discontinuous Galerkin method on networks is not standard, cf. [3], and requires designing appropriate numerical fluxes at junctions.

We introduce our own approach for boundary conditions at junctions, which uses special numerical flux choices. This approach is new and the behaviour of the resulting model can be understood as the introduction of branching lanes in front of the junction. This is a different approach to models in [2] and [3], which do not have branching lanes and overtaking is prohibited.

The scheme also requires limiters which prevent spurious oscillations in the numerical solution and keep the numerical traffic density in an admissible interval. All the above was performed on networks.

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References

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