

Numerical simulation of city traffic flows by using ionic transport models in porous medium

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Abstract - Traffic congestion is a common problem in cities. It can cost huge money due to wasted fuel, lost time and the increased cost of transporting goods through congested areas. The use of advanced traffic management systems such as adaptive traffic control and traffic analytics can significantly decrease traffic congestion levels, reduce greenhouse gas emissions, and improve traffic conditions and the safety of city transportation. In this presentation a numerical simulation model for city traffic flows is presented. The model is developed by using the concept of ionic transport in porous medium. Mathematically, traffic flow in city and ionic transport in porous medium have many similarities and thus they can be solved by using the same numerical methods. Apart from the detailed mathematical model, a number of simulation results are also presented. It is demonstrated that the simulation can provide important information on the traffic control such as smart street lighting, layers of additional services and city feature planning, etc.