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**Numerical investigation on lithium transport in the edge plasma of EAST real-time- Li-injection experiments in the frame of BOUT++**[1]

N.M. LI, J.Z. SUN, Dalian University of Technology, Z.H. WANG, swip, X.Q. XU, llnl, Z. SUN, L. WANG, J.S. HU, asipp, D.Z. WANG, Dalian University of Technology — Experimental observations on applications of Lithium (Li) have indicated that Li could benefit plasma performance. But all these call for further investigation on lithium transport. A simple model has been developed by reducing Braginskii's equations with assumed quasi-neutral condition for transport of Li species in the edge plasma in the EAST experiments of real-time Li aerosol injection and implemented in the frame of BOUT++. The simulation results show that Li atoms propagate inwards continuously during the Li injection, and the propagating depth of Li atoms depends on both the local plasma conditions along its path and the Li injection velocity. It is also found that Li ions accumulate rapidly in the edge, and only a small fraction of Li species can transport cross the magnetic field into the core. In the poloidal direction, Li ions drift swiftly downwards along the field lines, and transport much faster at the high field side than at the low field side. The strong interaction between background plasma and Li ions plays a critical role in determining the edge plasma profile. It is found that real-time Li injection raises the plasma density in the pedestal region and reduces the plasma temperature, just as has been observed experimentally

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