Abstract Submitted
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Discrete Boltzmann model of shallow water equations with polynomial equilibria[1] JIANPING MENG, XIAO-JUN GU, DAVID EMERSON, Scientific Computing Department, STFC Daresbury laboratory, Warrington WA4 4AD, United Kingdom, YONG PENG, JIANMING ZHANG, State Key Laboratory of Hydraulics and Mountain River Engineering, Sichuan University, Chengdu, 610065, P. R. China — A hierarchy of discrete Boltzmann model is proposed for simulating shallow water flows. By using the Hermite expansion and Gauss-Hermite quadrature, the conservation laws are automatically satisfied without extra effort. Moreover, the expansion order and quadrature can be chosen flexibly according to the problem for striking the balance of accuracy and efficiency. The models are then tested using the classical one-dimensional dam-breaking problem, and successes are found for both supercritical and subcritical flows.

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