Well-balanced Discontinuous Galerkin Method for Hyperbolic Conservation Laws

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We develop the structure-preserving high order discontinuous Galerkin methods for hyperbolic balance law, which can preserve a general equilibrium state and positivity-preserving property under a suitable time step at the same time. By introducing well-balanced numerical fluxes and corresponding source term approximations, we established well-balanced schemes. We also discuss about the weak positivity property of the proposed schemes, and the positivity-preserving limiter can be applied to enforce the positivity-preserving property effectively. Numerical examples have been provided to demonstrate the good properties.