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Bo Dong*, 285 Old Westport Road, North Dartmouth, MA 02747. *A new optimally convergent HDG method for Korteweg-de Vries type equations.* Preliminary report.

We develop and analyze a new hybridizable discontinuous Galerkin (HDG) method for solving third-order Korteweg-de Vries type equations. The method is defined by a discrete version of the characterizations of the exact solution in terms of local problems and transmission conditions, and the exact solution u and its derivatives $q := u_x$ and $p := u_{xx}$ are approximated by piecewise-polynomials of degree $k \geq 0$. We carry out stability analysis in the general case and error analysis in the linear case, and we find conditions on the stabilization parameters in the numerical traces under which the method is stable and has optimal convergence rates for u, q and p in L^2 -norm. Numerical results in both linear and nonlinear cases are displayed, which validate the optimal convergence rates in our error analysis. (Received September 19, 2016)