THE HDG METHODS: AN OVERVIEW

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Abstract. We give a brief overview of the development of the hybridizable discontinuous Galerkin (HDG) methods for partial differential equations since their inception in 2005. We present the main idea for the devising of these methods in the framework of steady-state diffusion problems. We then present the HDG methods, establish simple conditions for them to be well defined and discuss how their structure allows for an efficient implementation. Next, we uncover a stabilization mechanism that is responsible for the good performance of the method. We then discuss what could be considered to be five stages of the development of these methods. To end, we sketch the extension of the HDG methods to a wide variety of partial differential equations.

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