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## An a priori error analysis of the HDG method for linear Stokes problem using a pseudostress–velocity formulation\*

Rommel Bustinza $^{\dagger}$ 

## Abstract

In this talk we propose and analyze a hybridizable discontinuous Galerkin (HDG) formulation for the Stokes problem of incompressible fluid flow. The main unknowns here are the velocity, the so called pseudostress (cf. [1, 2, 6]), and the trace of velocity on the skeleton of the considered mesh of the domain. We remark that the referred trace unknown will be approximated by the well–known numerical flux of velocity, which allows us to rewrite the scheme as one defined on the skeleton of the mesh, reducing significatively the degrees of freedom. This can be done thanks to the linearity of the problem, which makes it possible the introduction of suitable local solvers. The corresponding projection–based a priori error analysis is developed following and/or adapting the ideas given in [3, 5], and ensures the expected (optimal) rates of convergence.

Key words: mixed-FEM, HDG, Stokes problem

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<sup>&</sup>lt;sup>†</sup>CI<sup>2</sup>MA and Departamento de Ingeniería Matemática, Universidad de Concepción, Casilla 160-C, Concepción, Chile, email: rbustinz@ing-mat.udec.cl

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