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COMPARISON BETWEEN DIFFERENT NUMERICAL DISCRETIZATIONS FOR A DARCY-FORCHHEIMER MODEL*

HILDA LÓPEZ†, BRíGIDA MOLINA†, AND JOSÉ J. SALAS‡

Dedicated to Víctor Pereyra on the occasion of his 70th birthday

Abstract. This paper is a numerical study of different discretizations for a mixed formulation of the Darcy-Forchheimer equation. Different finite elements are used: constant functions, conformal linear functions and Crouzeix-Raviart non-conformal finite elements. The behavior of the discretizations is analyzed through a comparative study of some test problems. The numerical results suggest that one of the proposed discretizations has better convergence properties for the velocity.

Key words. Darcy-Forchheimer's model, mixed formulation, numerical discretizations, finite elements, algorithm of alternating directions.

AMS subject classifications. 35Q35, 74S05, 58C15, 65F10

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† Centro de Cálculo Científico y Tecnológico, Escuela de Computación, Universidad Central de Venezuela, Caracas, Venezuela. {hlopez,bmolina}@kuaimare.ciens.ucv.ve.

‡ Departamento de Educación Física y Matemáticas, Universidad Católica Andrés Bello, Caracas, Venezuela. jsalas@ucab.edu.ve.