Residual-based a posteriori error indicator for a dual-mixed method for the Darcy-Forchheimer model

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Abstract: The Darcy-Forchheimer model is used to describe fluid flow through porous media when the fluid velocity is moderate or high. In this talk, we consider the dual-mixed finite element method proposed by Pan and Rui [1] to numerically solve the Darcy-Forchheimer model. The pair velocity-pressure is approximated by Raviart-Thomas elements. We develop a novel a posteriori error analysis and derive a reliable a posteriori error indicator of residual type. Moreover, we provide a numerical study that supports its use in practice.

References:

[1] H. Pan and H. Rui, Mixed element method for two-dimensional Darcy-Forchheimer model, J. Sci. Comput. 52 (2012) 563–587.