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A NEW RESIDUAL LEAST SQUARES ERROR ESTIMATOR FOR FINITE VOLUME METHODS – APPLICATIONS TO LAMINAR FLOWS

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Abstract. Adaptive refinement is an important technique to reduce the computation time of flows in very refined meshes and increasing the local accuracy of the simulation.
A new a-posteriori error estimator, suitable for h-adaptive methods on unstructured grids, is based on the residual evaluation and a high-order polynomial reconstruction.The results are performed by the authors own Navier-Stokes code, which has been used to solve different adaptive problems [1, 2, 3].
The residual least squares (RLS) estimator is applied to different problems with a known analytic solution to study the numerical error decay with the adaptive algorithm and it is compared with the classic Taylor Series estimator [4, 5]. The proposed adaptive procedure is also applied to 3D flows around a sphere for two different types of grids.

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