# On performance of residual based a posteriori error estimates

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## Abstract

First, a survey of different known implicit a posteriori residuum based error-estimator methods through locally-supported functions (elements or patches) is presented. They rely in the partition of unity, space projection and space enhancement. Afterwards the idea of treating the residual as a pre-stress for the error problem is introduced, leading to the convenience of applying the residual in element centred patches element-wise rather than averaging the different patch contributions in the post-process. Then, the decoupling of the error fluctuation over the element edges and over the element interior in addition to the fore-mentioned concepts are used to compose a new estimate. Finally the new estimate is compared to the predecessors in terms of accuracy, cost-efficiency and ease of implementation.