

Some Remarks on A Posteriori Finite Element Error Analysis and DWR

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The overwhelming success of Heidelberg's Dual Weighted Residual (DWR) Technology is essentially based on striking numerical evidence. The theoretical justification appears less clear in the sense that the best known post-processing algorithms are employed to approximate the unknown exact dual solution z and/or its higher derivatives. All the information is utilised to compute and perhaps nothing left for strict error control.

The presentation discusses three different versions of the DWR and studies them numerically for a simple Poisson model equation followed by eigenvalue problems and ends with an outlook for nonlinear minimisation problems.