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A posteriori goal-oriented error estimators based on equilibrated flux and potential reconstructions

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Nowadays, many engineering problems require computing some quantities of interest, which are usually linear functionals applied to the solution of a partial differential equation. Error estimations of such functionals are called “goal-oriented” error estimations. Such estimations are based on the resolution of an adjoint problem, whose solution is used in the estimator definition, and on the use of some energy-norm error estimators.

In this talk, an overview of such techniques in different contexts will be given. We will then provide an upper-bound of the error which can be totally and explicitly computed for various discretization schemes. Finally, the behaviour of such estimators on some numerical benchmarks will be investigated. Two models will be particularly considered : a reaction-diffusion problem, and an eddy-current problem, arising in the context of low-frequency electromagnetism.

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