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From a posteriori analysis to automatic modelling

Abstract: A posteriori analysis is presently a basic tool for the numerical solution of partial differential equations: It leads to the construction of error indicators which can be explicitly computed and allows for the optimization of all the parameters involved in the discretization. Among new applications is the choice of a simplified model in the zones where this does not increase the global error. As an example, we present the automatic coupling of a turbulence model with the Navier–Stokes equations.