

Modeling error estimates in fluid mechanics: An a posteriori approach

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We present some recent developments in modeling error estimation in fluid mechanics, i.e. estimation of errors caused by the choice of the mathematical model for the fluid in consideration. Among other topics, in our interest is the use of ideally incompressible fluid models to describe slightly compressible fluids: For example, we present an explicit error estimate for the error caused by approximating the compressible Navier-Stokes equation by the incompressible Navier-Stokes equation. The estimates are based on relative entropy techniques and an a posteriori error estimation approach, relying on the explicit knowledge of the (exact or numerical) solution to the simplified model.

REFERENCES

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- [2] –, Approximation of slightly compressible fluids by the incompressible Navier-Stokes equation and linearized acoustics: a posteriori estimates, *Preprint* (2015).