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Fluid mechanics experiments with MRV and applications in reactor safety and CFD validation studies

**Abstract:**

Magnetic resonance velocimetry (MRV) enables the quantification of velocity vectors, turbulence statistics, scalar transport and many other fluid mechanical properties in fluid flows. Although MRV offers relatively low temporal and spatial resolution compared to laser-optical techniques and has some limitations in materials, the main advantage is that MRV provides a complete three-dimensional representation of the flow field in a short time. The full-field experimental data obtained with MRV is often referred to as "CFD-grade data" because it allows full-field validation of numerical solutions obtained with Computational Fluid Dynamics (CFD), the industry standard tool. This talk covers the possibilities and requirements of MRV experiments and focuses on the validation of CFD codes for various problems and current applications such as reactor safety studies.