Data Assimilation; effects of the higher order interpolation

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Abstract:

Data assimilation refers to a class of techniques that inject spatially coarse observational data into mathematical models to obtain better forecasts of physical systems. We discuss an approach which adds a feedback control term at the PDE level to synchronize the computed solution with the true solution corresponding to the observed data.

In this talk, after a survey of recent rigorous results supporting this method for fluid dynamics, we discuss using higher order finite elements to interpolate data on a coarse grid. We then demonstrate computationally that the synchronization is achieved at better rate than with linear interpolation. This is part of a joint work with Michael Jolly.