Approximate Deconvolution Leray Reduced Order Model

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This talk focuses on regularized reduced order models (Reg-ROMs) for the incompressible Navier-Stokes equations. In particular, we are interested in Leray ROM (L-ROM) and approximate deconvolution Leray ROM (ADL-ROM). In L-ROM, a differential filter is used to smooth the numerical oscillations that arise in the Galerkin ROM (G-ROM) for large Reynolds numbers in the under-resolved regime. In ADL-ROM, the aim is to deconvolve the filtered variable in L-ROM to increase its accuracy without compromising its stability. We show preliminary ADL-ROM numerical results, including the post-processing on the G-ROM solution obtained through the ROM differential filter and the AD operator.

This is a joint work with Francesco Ballarin (Università Cattolica del Sacro Cuore), Ian Moore, and Traian Iliescu (Virginia Tech).