

A HIGHER FIDELITY APPROXIMATE DECONVOLUTION MODEL FOR FLUID-FLUID INTERACTION PROBLEM

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Abstract. A method was proposed by Connors, Howell and Layton in 2012, that decouples a fluid-fluid interaction problem with the rigid lid condition on the interface. This method is stable, but only first order accurate in time. In order to improve the accuracy, we've recently proposed a modification of this method, based on the deferred correction technique, that allowed for the second order temporal accuracy. Here we will build on this result, aiming at modeling fluid-fluid interaction in a turbulent regime. We start with Approximate Deconvolution turbulence model (ADM), and modify it into ADMC - Approximate Deconvolution Model with Correction. Combining it with deferred correction creates a new method for fluid-fluid interaction in turbulent regime; this method is stable, second order accurate in time, and fourth order accurate in the filtering width parameter of the ADM.

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