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Saad Qadeer* (saadq@email.unc.edu) and **Boyce E Griffith**. *The Smooth Forcing Extension Method*.

Numerical techniques for solving fluid problems in irregular domains are typically low-order accurate, making them unsuitable for complex fluid computations since the stresses may fail to converge pointwise. The Immersed Boundary Smooth Extension method was introduced to remedy this; however, its structure rendered it ill-conditioned and unfeasible for time-dependent problems. In this talk, we shall present a similarly inspired technique, known as the Smooth Forcing Extension method. Our approach allows for convergence at arbitrarily high orders and can be easily extended to higher dimensions and complicated geometries. We shall demonstrate its effectiveness on a variety of test problems, including the time-dependent setting, before outlining strategies for further exploration (Received January 15, 2020)