

1048-65-228

Elizabeth L Bouzarth* (bouzarth@math.duke.edu), Duke University, Department of Mathematics, Box #90320, Durham, NC 27708. *A multi-explicit spectral deferred correction method applied to regularized Stokeslets.*

Regularized Stokeslets provide a way to calculate fluid velocities in the Stokes regime due to regularized point-forces. In this discussion, the method of regularized Stokeslets is used to model immersed rigid or elastic objects by connecting such forces with springs, potentially introducing stiffness into the underlying system of ODEs. In certain scenarios, the fluid velocity can be decomposed to isolate stiffness into one portion of the velocity, leaving the remainder non-stiff. The multi-explicit spectral deferred correction (MESDC) method utilizes such a decomposition and integrates the stiff velocity component with a small time step while treating the non-stiff component with a larger time step. This eliminates unnecessary expensive calculations while still treating the system explicitly in a stable, efficient manner. (Received February 09, 2009)