

Title: Spectrally Accurate Evaluation of Layer Potentials

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Abstract:

Rheology problems of particulate flows governed by the Stokes equation can be numerically solved using the integral equation methods. In such solution methods, accurate evaluation of the layer potentials is desired by many applications in which the interfaces of particles could be as close as almost touching each other. These situations are nicely handled by our new evaluation scheme for Stokes layer potentials. Our scheme splits the Stokes potential into several Laplace potentials, evaluating each of them with spectrally accurate quadratures along the interface using only a small number of quadrature nodes. The result of our scheme is uniformly spectrally accurate in space, even for targets almost touching the interface