

Abstract Submitted
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A hybrid Pseudo-spectral Immersed-Boundary Method for Applications to Aquatic Locomotion ZHENG REN, DAVID HALL, KAMRAN MOHSENI — A hybrid pseudo-spectral immersed boundary method is developed for application in marine locomotion. Spatial derivatives are calculated using pseudo-spectral method while a 2nd-order Runge-Kutta scheme is used for time integration. The singular force applied on the immersed boundary is obtained using a direct forcing method. To avoid Gibb's phenomenon in the spectral method, we regularize the force by smoothing it over several grid cells. This method has the advantage of spectral accuracy and the flexibility to model irregular, moving boundaries on a Cartesian coordinate without complex mesh generation. The method is applied to examine locomotion of jellyfish for both jetting and paddling jellyfish.

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