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Settling of randomly formed marine aggregates EUNJI YOO, SHILPA KHATRI, FRANOIS BLANCHETTE, Applied Mathematics, University of California, Merced — Settling marine aggregates plays an important role in transporting carbon from the surface ocean to the deep ocean. Investigation of settling rates is critical to understand the ecological importance of these particles. We study the settling of Diffusion-Limited-Aggregates as a model of marine aggregates in the ocean. The aggregates are assembled as a collection of cubic particles formed by cluster-to-cluster aggregation, resulting in fractal objects. The stresses on the surface and flow around the aggregates are computed in the limit of zero Reynolds number using a single-layer potential boundary integral method and we handle the challenges of singularities analytically. We first validate and analyze the performance of our numerical method. We then present the statistical distribution of drag and torque on aggregates of various sizes. We determine that the gyration radius is the most relevant length scale to describe the dynamics of those aggregates and obtain expressions for average drag and torque acting on settling aggregates.

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