

## SIMULATING THE INTERACTION OF TWO DIFFERENTIAL-SIZE SEDIMENTING SPHERES

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The drafting, kissing and tumbling (DKT) motion of two freely falling spheres are investigated numerically by using an immersed-boundary method[1] and a parallel multilevel preconditioned iterative pressure Poisson solver[2] built on PESTc[3]. The main purpose of this study is to investigate the hydrodynamic interactions of two spheres with different sizes at two initial arrangements. Translational and rotational characteristics are studied around the surfaces of both spheres, and their transitional changes during the DKT processes are fully investigated. The influence of diameter ratio (DR) can be clearly observed when focusing on the time duration of the kissing process where the trailing sphere rolls around the surface of the leading one. Therefore, when the small sphere is placed below the larger one, the larger the diameter ratio, the shorter the kissing process last. On the other hand, the time duration of the kissing stage increases in tandem with the increase of diameter ratio as the large sphere is placed below the smaller one. Also, the two spheres undergoes a transition in the dynamic behavior from DKT interactions and continuous separating process through a threshold DR.

### REFERENCES

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