A new set of correlations of drag, lift and torque coefficients for non-spherical particles and large Reynolds numbers

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A new set of correlations of drag, lift and torque coefficients for non-spherical particles and large Reynolds numbers

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Abstract

In this paper, we derive and validate new correlations for the drag, lift and pitching torque coefficients for non-spherical particles and a large range of Reynolds numbers Re_p and aspect ratios $w \in [1-32]$. The functional forms of these correlations, depending on Re_p, w and incidence angle, α are determined by fitting the results extracted from DNS computations of the flow around prolate ellipsoidal particles. This work follows that of Ouchene *et al.* [1] in which the numerical method was implemented and validated. A complete set of correlations for prolate ellipsoidal particles outside Stokes regime is provided.