

Abstract Submitted  
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**Effects of rarefaction and shape on the drag of spheroidal particles using the DSMC method** COSIMO LIVI, RALF R.L. REINARTZ, GIANLUCA DI STASO, HERMAN J.H. CLERCX, FEDERICO TOSCHI, Eindhoven Univ of Tech — The capability to simulate a two-way coupled interaction between a rarefied gas and an arbitrary-shape colloidal particle is important for many practical applications. By means of numerical simulations based on the Direct Simulation Monte Carlo (DSMC) method we investigate the influence on the drag coefficient in case of ellipsoidal particles of several parameters, including rarefaction conditions, the particle orientation, the particle aspect-ratio, and the gas-solid boundary conditions. The motivation is to model the transport of such particles in high tech mechanical systems. We evaluate the drag force exerted by the gas on the ellipsoidal particle using a momentum exchange approach for an oblate and prolate ellipsoid, at different angles of attack and rarefaction levels. The drag force is then compared with the one obtained for a spherical particle at equivalent rarefaction conditions.

Cosimo Livi  
Eindhoven Univ of Tech

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