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Ensuring consistent particle drag predictions between Euler-Euler, Euler-Lagrange, and sub-grid informed drag models[1] W. C. MOORE, S. BALACHANDAR, University of Florida — Accurately predicting the forces on particles is essential when performing simulations of particle-laden flow. Mean drag models are typically used in both Euler-Euler (EE) and Euler-Lagrange (EL) simulations since sub-grid information is limited. While these mean drag models are well suited to predict the average force experienced by a fixed array of particles, their use in EE and EL frameworks is a necessary, albeit crude, approximation. Such simulation ignore the effects of relative particle motion and sub-grid volume fraction variations on the drag experienced by the particles. Here, these effects are studied, and a force consistency relation is introduced to ensure that drag models used for EE and EL are consistent with sub-grid informed drag predictions.

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William Moore
University of Florida

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