

Abstract Submitted  
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**Interaction of a finite-sized stationary particle with turbulent channel flow**<sup>1</sup> LANYING ZENG, University of Illinois, S. BALACHANDAR, University of Florida, FADY NAJJAR, University of Illinois, PAUL FISCHER, Argonne National Lab — The interaction of a *finite-sized* particle with a turbulent channel flow is considered using DNS. Different particle sizes and particle locations in the channel are used to study the interaction. The particle Reynolds number is varied from 40 to about 450, and the particle is fixed either in buffer region or at the channel center. A spectral element methodology is used to discretize the channel exterior of the embedded sphere. Great care is taken to ensure complete resolution of all the relevant length scales of the wall turbulence, attached boundary layers and the unsteady wake behind the sphere. In this talk, we will present the effect of the turbulent channel flow on the particle wake and vortex shedding, and also the modulation of turbulent channel flow in the particle wake. The results will be compared and contrasted with the similar study for isotropic turbulence.

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