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Near-wall, particle-laden turbulent transport DAVID RICHTER, University of Notre Dame, PETER SULLIVAN, National Center for Atmospheric Research — We use direct numerical simulation coupled with a Lagrangian point-particle formulation to study turbulent planar Couette flow at friction Reynolds numbers ranging between 125 and 900. Modifications to wall-normal scalar and momentum transport are investigated as a function of the size and concentration of the dispersed phase. Furthermore, the dispersed phase effects are examined as the Reynolds number of the flow is increased. In all cases particle phase is observed to weaken the structures responsible for near-wall transport (e.g. hairpins, quasi-streamwise vortices, etc.); an effect which becomes increasingly pronounced as the Reynolds number increases. Physical explanations for this behavior will be presented.

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