Abstract Submitted
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**Large-eddy simulation of zero-pressure-gradient turbulent boundary layer with solid particle suspension**[1] MUSTAFA RAHMAN, RAVI SAMTANEY, King Abdullah University of Science and Technology — We present results of solid particles suspension and transport in a fully-developed turbulent boundary layer flow using large-eddy simulation of the incompressible Navier-Stokes equations. We adopt the Eulerian-Eulerian approach to simulating particle laden flow with a large number of particles, in which the particles are characterized by statistical descriptors. For the particulate phase, the direct quadrature method of moments (DQMOM) is chosen in which the weights and abscissas of the quadrature approximation are tracked directly rather than the moments themselves. The underlying approach in modeling the turbulence of fluid phase utilizes the stretched spiral vortex subgrid-scale model and a virtual wall model similar to the work proposed by Inoue & Pullin (J. Fluid Mech. 2011). The solver is verified against simple analytical solutions and the computational results are found to be in a good agreement with these. The capability of the new numerical solver will be exercised to investigate turbulent transport of sand in sandstorms. Finally, the adequacy and limitations of the solver will be discussed.

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