Abstract Submitted
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**Large-eddy simulation of a solid-particles suspension in a turbulent boundary layer**[1] MUSTAFA RAHMAN, RAVI SAMTANEY, KAUST — We decribe a framework for the large-eddy simulation of solid particles suspended and transported within an incompressible turbulent boundary layer. The underlying approach to simulate the solid-particle laden flow is Eulerian-Eulerian in which the particles are characterized by statistical descriptors. For the fluid phase, the large-eddy simulation (LES) of incompressible turbulent boundary layer employs stretched spiral vortex subgrid-scale model and a virtual wall model similar to the work of Inoue & Pullin (J. Fluid Mech. 2011). Furthermore, a recycling method to generate turbulent inflow is implemented. For the particle 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 numerical method in this framework is based on a fractional-step method with an energy-conservative fourth-order finite difference scheme on a staggered mesh. It is proposed to utilize this framework to examine transport of sand in desert sandstorms.

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