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**Numerical prediction of pollutant dispersion into ABL; a Lagrangian approach using LES** MICHAEL MORIKONE, University of Central Florida, STEFAN LLEWELLYN SMITH, University of California, San Diego, MARCEL ILIE, University of Central Florida — Air pollution is one of the major environmental challenges facing humankind today. The accurate prediction of fate and transport of pollutants into the atmospheric boundary layer would improve the health quality and duration of human life, and thus is of critical importance. The pollutants are transported along the wind direction, but it is the atmospheric turbulence that determines the dispersion of the pollutants. An efficient Eulerian-Lagrangian particle dispersion algorithm for the prediction of pollutant dispersion in the atmospheric boundary layer (ABL) is proposed. The volume fraction of the dispersed phase is assumed to be small enough such that particle-particle collisions are negligible and properties of the carrier flow are not modified. With the examination of dilute systems only the effect of turbulence on particle motion has to be taken into account (one-way coupling). With this assumption the continuous phase can be treated separate from the particulate phase. The continuous phase is determined by large-eddy simulation in the Eulerian frame of reference whereas the dispersed phase is simulated in a Lagrangian frame of reference. The results of the present study indicate that the particle shape and size influences the particle dispersion.

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