

# Surface flux parameterization for large eddy simulation

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Atmospheric large eddy simulations (LES) need to use a surface flux parameterization that gives turbulent transport between the ground surface and lowest grid level. However, the use of a conventional surface flux parameterization in the LES is conceptually inappropriate, since a part of turbulent eddies are resolved in the LES. Sensitivity experiments using atmospheric LES suggest that this issue may be negligible for mean quantities but may not be so for variances of horizontal wind speeds. Based on reliable databases of turbulence near the surface, which are obtained from direct numerical simulations and wind tunnel experiments, and we propose a simple modification to the conventional surface flux parameterization: filtering out turbulent fluctuations whose scales are larger than the correlation time and length of turbulence, respectively. We attempt a preliminary test of a modified LES in which temporally averaged wind speeds are considered in the surface flux parameterization. This test shows that variances of horizontal wind speeds near the surface are closer to the log-law suggested by the wind tunnel experiment.