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Large-eddy simulation of the stable atmospheric boundary layer with explicit filtering and reconstruction[1] FOTINI CHOW, BOWEN ZHOU, University of California, Berkeley — Large-eddy simulation (LES) of the stably stratified atmospheric boundary layer is performed using an explicit filtering and reconstruction approach with a finite difference method. The dynamic reconstruction model (DRM) is used to represent the resolvable subfilter-scale and subgrid-scale stresses which make up the total turbulent stress. Several surface cooling rates are used, ranging from mildly stable to strongly stable intermittent turbulence cases. A low-level jet develops with associated turbulent kinetic energy (TKE) generated around the top of the boundary layer, in agreement with field observations. The role of filtering on generation of this elevated TKE is explored. The ability of the DRM to represent energy backscatter from small to large scales is examined as a function of surface cooling and grid resolution. A turbulent bursting event is analyzed during intermittent conditions.

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