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**Geoscientific
Model Development
Discussions**

Interactive comment on "Unified parameterization of the planetary boundary layer and shallow convection with a higher-order turbulence closure in the community atmosphere model: single column experiments" *by* P. A. Bogenschutz et al.

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1) Currently CLUBB has no explicit parameterization of the cloud-top radiative cooling as presented in Bretherton and Park (2009), which was designed for coarse vertical grid spacing. In CAM-CLUBB cloud top cooling is fed implicitly to CLUBB by tendencies computed from the radiation scheme.

However, we have done many global experiments of CAM5 with this explicit parameterization (appendix C of Bretherton and Park 2009) turned off and the representation

of marine stratocumulus does not change much whether or not this parameterization is used. This cloud-top cooling parameterization, however, does appear to be important for the representation of high-level stratiform cloud in the storm track regions. Therefore, we are exploring the option of incorporating an explicit parameterization of cloud top cooling for coarse vertical grids in future versions of CAM-CLUBB.

2) The equations are described in Larson et al. (2012) in Monthly Weather Review. In the next draft we will be sure to point to that reference for those equations.

Interactive comment on Geosci. Model Dev. Discuss., 5, 1743, 2012.