

Title: Development of a new subgrid PDF shape for E3SM: Current status

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Abstract:

The subgrid PDF shape currently employed in E3SM to calculate cloud fraction and various turbulence closures is CLUBB's Analytic Double Gaussian 1 (ADG1) shape. This PDF shape has the virtue of simplicity, but it is too bimodal in vertical velocity. In particular, it produces a pronounced double maximum when skewness is large. This limits its potential accuracy in activating aerosol, particularly in cumulus clouds.

Here we discuss our efforts as part of the EAGLES project to formulate a new PDF shape. We elect to retain a double Gaussian functional form, but we introduce extra flexibility in the shape.

The new PDF shape produces more realistic tails as compared to LES. Sample results will be shown in this presentation.