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Forecasting the weather
- ensemble techniques
in probabilistic weather prediction

Subgrid model choice and grid resolution issues in large eddy simulation of katabatic flow

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The accuracy of mesoscale flow forecasts in complex terrain depends on the ability of the model to accurately resolve topography and parameterize subgrid scale (SGS) fluxes of momentum and temperature. Increases in computing power have allowed large eddy resolving simulations (LES) of mesoscale phenomena to become possible, however, a number of questions remain regarding LES of stably stratified flows over complex terrain. In this study we compare the ability of three different SGS models, the standard Smagorinsky model with wall matching function, the Lagrangian dynamic model and the scale dependent Lagrangian dynamic model, to adequately simulate stably stratified drainage flows on a simple slope in a terrain following coordinate system. Particular attention is applied to effect of each type of SGS model on the resolved flow, and the effect of highly anisotropic grids that are often used in mesoscale models. Simulation results are compared with the Rattlesnake ridge data and past numerical studies.