P53   Analysis of seasonally-dependent bias in WRF PBL schemes for the southern Appalachian Mountains.

Thaxton, Chris and Quinlin Riggs, *Appalachian State University*

WRF PBL schemes consistently produce biases in temperature, moisture, and wind profiles through the planetary boundary layer (PBL), as well as PBL height, for the Southern Appalachian Mountains (SAM), over all diurnal and seasonal phases. Overall bias trends are significantly different between buoyancy-dominated (summer) and shear-driven stable (winter) boundary layers. Through analysis of a growing suite of radiosonde data for winter and summer seasons, we attempt to discern mechanical from buoyant turbulence production rates and quantify seasonal shortcomings of flux-gradient and mixing length closure models for the SAM region. The aim is to conditionally modify existing WRF PBL schemes based on diagnosed flow and thermodynamic parameters, to more accurately (1) capture the orographic form, blocking, and gravity wave drag effects in the SAM and (2) parameterize the complex heat exchange mechanisms that are common in complex terrain, especially during diurnal transitions.