



The Entrainment Interface Layer of Stratocumulus-topped Boundary Layers

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The entrainment interface layer (EIL) is the layer between cloud top and the free atmosphere. It contains mixtures of air from the cloud layer and the free atmosphere. In addition to turbulent mixing, phase changes and radiative heating or cooling also affect the thermodynamic properties of air in the EIL. Eventually, air from the EIL is entrained into the cloud layer. How do processes in the EIL affect the entrainment rate? What is the structure of the EIL? Is cloud-top an interface (a region of high gradients), or simply an iso-surface?

We are using airborne measurements taken in the EIL during POST (Physics of Stratocumulus Top), which took place during July and August 2008 near Monterey, California, USA, to address these questions. High-rate measurements of temperature and liquid water content made just 0.5 m apart allow us to perform a high-resolution analysis of a conserved variable (liquid water potential temperature). When combined with lower-rate measurements of water vapor, they also allow us to perform a mixture fraction analysis following vanZanten and Duynkerke (2002).