

Interactive comment on “Perturbations in relative humidity in the boundary layer represent a possible mechanism for the formation of small convective clouds” by E. Hirsch et al.

Anonymous Referee #2

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This study uses a parcel model to study the formation of convective clouds. The authors claim in the abstract that clouds form in their model well below the lifting condensation level. If this were the case, then they would have clouds forming at subsaturated relative humidities, which seems incorrect. I presume that the authors mean that the clouds form at levels below the level of the mean LCL. This is not surprising either. It has been known for a long time that cumulus clouds tend to form in anomalously humid parcels (often the parcels are humidified by evaporation from a moist surface). The authors do not provide a justification for where the high humidity parcels originate, but my guess would be that the surface is the source. If this is the case, then it is

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difficult for me to see what is really new about this work. A detailed parcel model of the type employed here is not needed to understand the situation. Much work has been carried out since the late 1970s to represent the humidity and temperature in the PBL as stochastic variables (either correlated or uncorrelated). The work of Mellor and Deardorff (both 1977) set the stage for this concept, which has, since the early 1990s found its way into parameterizations used in GCMs.

In its current state, I cannot recommend this paper for publication because it does not appear to offer significant advances over what has been known for years. The authors will need to work hard to make it clear what is really new here.

Interactive comment on *Atmos. Chem. Phys. Discuss.*, 13, 28729, 2013.