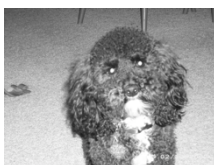


# Energy and Moisture Fluxes in the Giga-LES

JoBeth Minniear

Mentors:

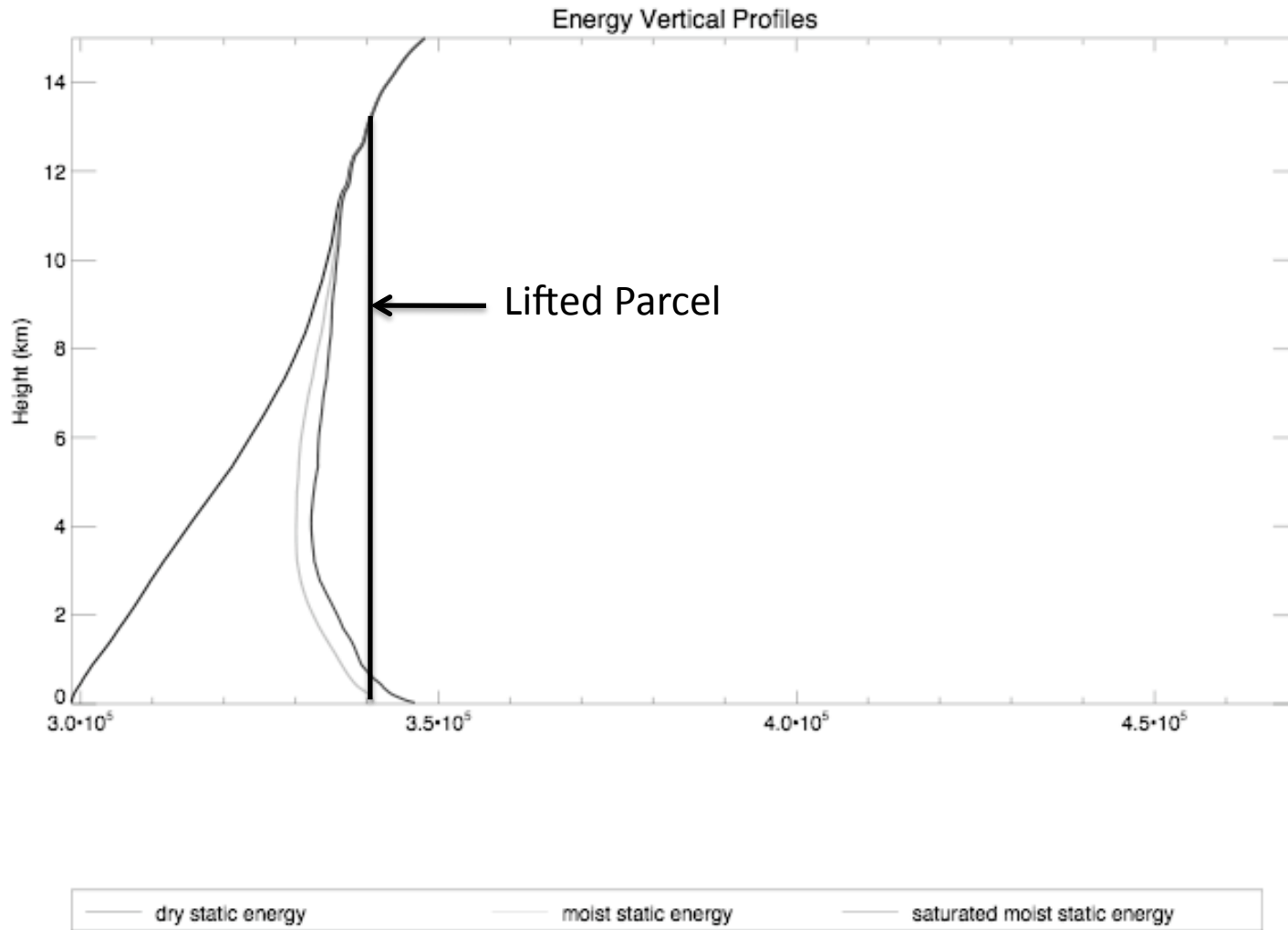
David A. Randall and Mark Branson



# Giga-LES

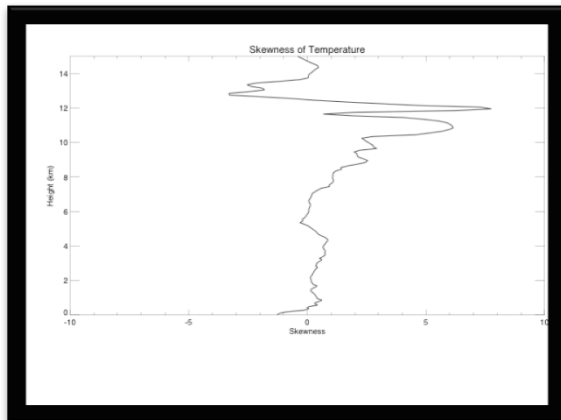
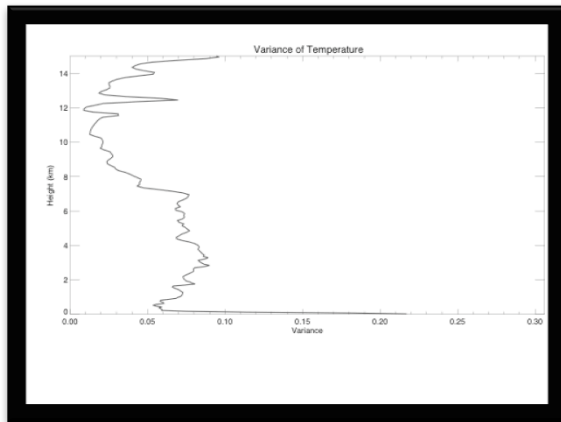
- Covers large domain to represent a tropical convective system
- Very high resolution

# CAPE and CIN

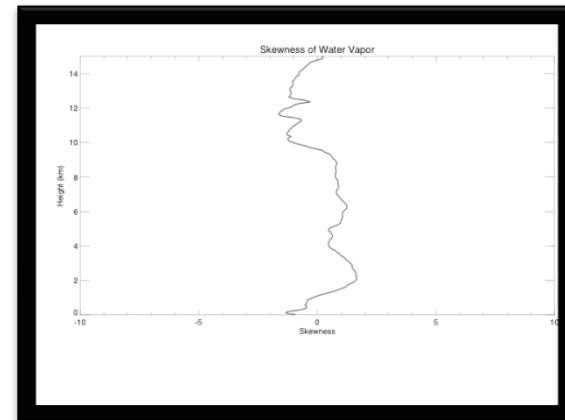
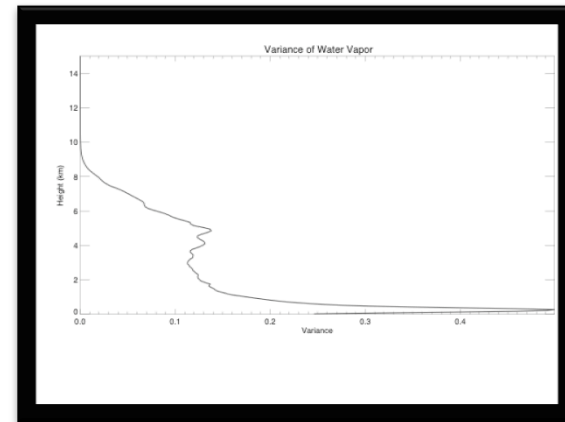


# Variance and Skewness

Temperature



Water Vapor



Variance

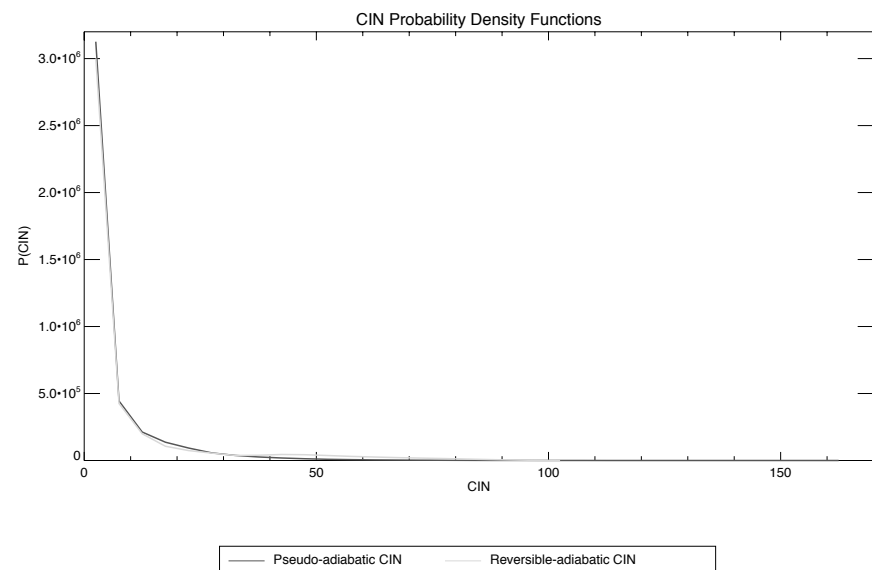
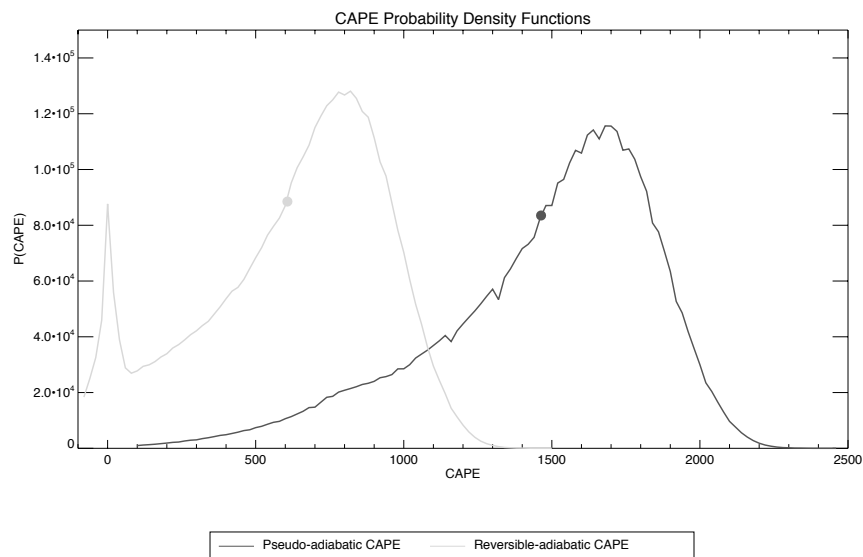
$$\overline{T'^2}$$

Skewness

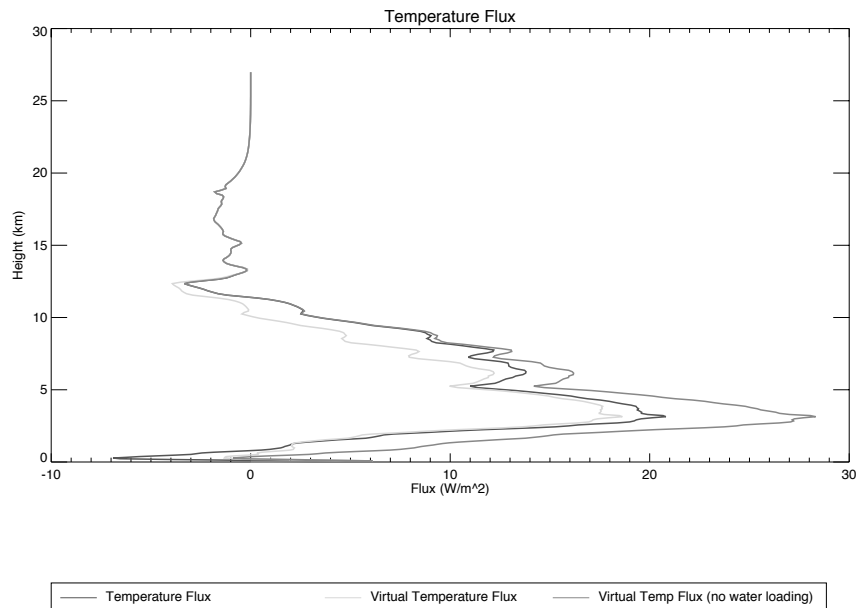
$$\frac{\overline{T'^3}}{(\overline{T'^2})^{3/2}}$$

# CAPE and CIN

Which parcel should be used to calculate CAPE and CIN?



# Temperature Flux



$$\rho C_p \overline{w'T'}$$

Rate at which CAPE is converted into convective kinetic energy

# Why is this Important?

- This process is the essence of why clouds exist.
- Better models give better forecasts.





# Future Work

I would like to  
improve thunderstorm  
forecasts.



# References and Acknowledgements

Moeng, C.-H., M. A. LeMone , M. Khairoutdinov , S. Krueger , P. Bogenschutzc and D. A. Randall, 2009: The tropical marine boundary layer under a deep convection system: a large-eddy simulation study. Submitted to JAMES.

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