

Cleveland State University

EngagedScholarship@CSU

Undergraduate Research Posters 2016

Undergraduate Research Posters

2016

How Dry is the Lower Atmosphere: Finding Relations Between Various Moments in the Atmospheric Boundary Layer

Vladimir Sworski
Cleveland State University

Follow this and additional works at: https://engagedscholarship.csuohio.edu/u_poster_2016



Part of the [Life Sciences Commons](#), [Medicine and Health Sciences Commons](#), and the [Physical Sciences and Mathematics Commons](#)

[How does access to this work benefit you? Let us know!](#)

Recommended Citation

Sworski, Vladimir, "How Dry is the Lower Atmosphere: Finding Relations Between Various Moments in the Atmospheric Boundary Layer" (2016). *Undergraduate Research Posters 2016*. 30.

https://engagedscholarship.csuohio.edu/u_poster_2016/30

This Book is brought to you for free and open access by the Undergraduate Research Posters at EngagedScholarship@CSU. It has been accepted for inclusion in Undergraduate Research Posters 2016 by an authorized administrator of EngagedScholarship@CSU. For more information, please contact library.es@csuohio.edu.



How Dry is the Lower Atmosphere: Finding Relations Between Various Moments in the Atmospheric Boundary Layer

College of Sciences and Health Professions

Student Researcher: Vladimir Sworski

Faculty Advisor: Thijs Heus

Abstract

The Atmospheric Boundary Layer (ABL), consisting of the bottom few kilometers of the troposphere, is a highly turbulent region with strong mixing of moisture and winds. This region's activity is driven by thermals, which rise to the top of the boundary layer and thicken it through entrainment of warm air from above. To better predict the behavior of the ABL, a good understanding of the distribution of heat, moisture and momentum is important. In this study, we use a high resolution computer model (LES) to determine those distributions. We were able to reproduce observations when using a temporal averaging that is close to the algorithm used in the observations. However, we found significant discrepancies between temporal and spatial averaging of the same model results. For example, skewness and kurtosis have a strong relationship that helps describe the shape of the distribution. It showed that there is significantly fewer points with both positive skewness and kurtosis. This is related to a strong change that is also present between the temporal and spatial third moments. A study of these differences was also conducted.