Assessing the Effects of Storm Depth on TDS Height Interpretation in Tornado Intensity Estimation

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Overview and Background

- Most tornadoes in the United States are produced by two types of storms, quasi-linear convective systems (QLCS) and supercell thunderstorms
- With the advent of dual-polarization radar in the early 2010’s, correlation coefficient was able to be used to study the tornado debris signature (TDS) and its effect on tornado strength estimation
- This study attempts to use storm depth as way of furthering the use of the TDS in strength estimation

Methodology

- A database with over 175 tornadoes and their TDS heights was provided by the National Weather Service (NWS) office in Jackson, Mississippi
- Each tornado was examined for its storm depth by using echo top height
- A total of 125 tornadoes were able to be analyzed with 49 being produced by QLCSs and 76 by supercells

Results

- Initial analysis is inconclusive on whether or not storm depth may be a useful tool in analyzing tornado intensity in real-time
- Preliminary results suggest that normalized TDS height is less effective than raw TDS height at discriminating tornado strength
- Future work will include expanding the number of tornadoes in the dataset in order to reduce small sample size errors

Conclusions and Future Work

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Acknowledgements

I would like to thank Chad Entremont and Daniel Lamb of the NWS office in Jackson, Mississippi as well as Dustin Conrad for their contributions to this project. In addition, I would like to thank David Cook and Dr. Bernhard Vogler for creating and sponsoring the RCEU program. All RCEU projects were sponsored in part by the UAH Office of the Provost, UAH Office of the Vice President for Research and Economic Development and the Alabama Space Grant Consortium.