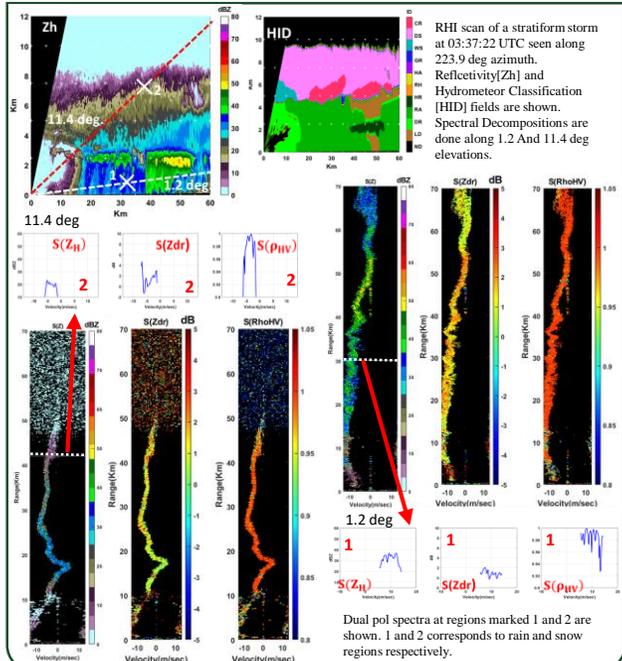




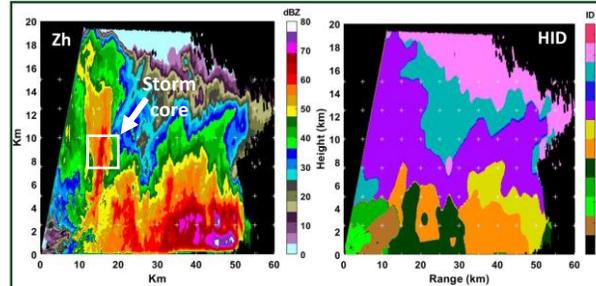
## Introduction

- The C-Band CSU-CHIVO radar was deployed in the Cordoba region in Argentina between June 2018 and April 2019 during the Relampago (Remote sensing of Electrification, Lightning, And Mesoscale/Microscale Processes with Adaptive Ground Observations) field campaign. It recorded some of the tallest storms in the world which is characterized by strong wind shear, updraft motion, turbulence and occurrence of severe hail and rain.
- The polarimetric spectrum in precipitation with rain and hail mixtures are characterized. Spectral polarimetry revealed different spectral characteristics including multi-modal spectrum, spectral broadening and lowering of coherency spectrum [1].

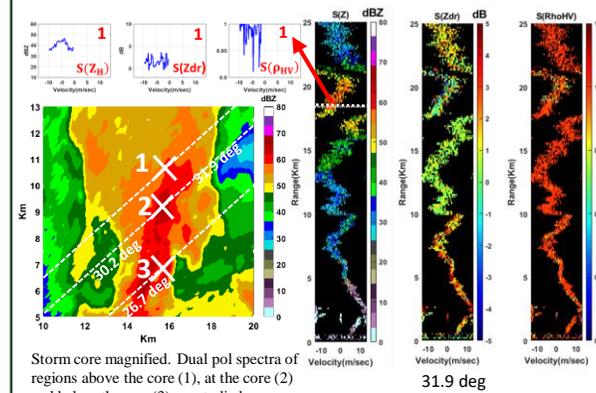
## Rain event observed by CSU - CHIVO radar on 30<sup>th</sup> Nov 2018



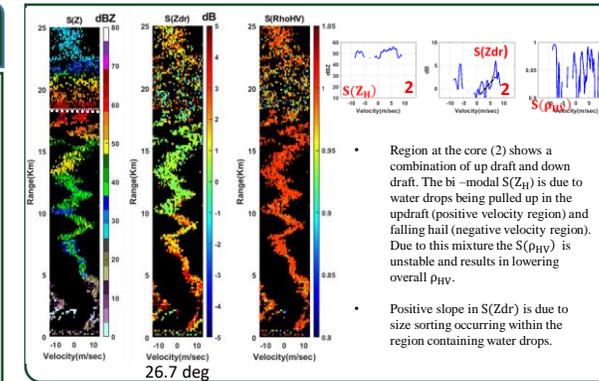
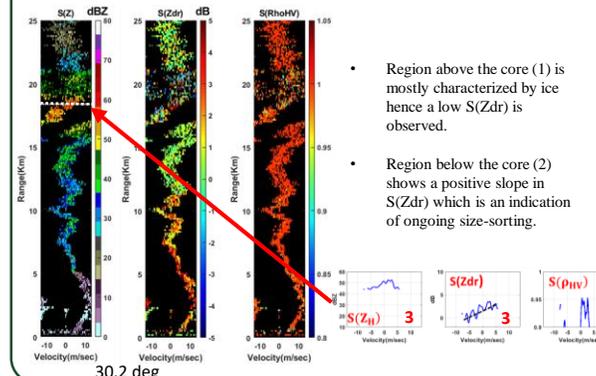
## Rain & Hail event observed by CSU - CHIVO radar on 25<sup>th</sup> Jan 2019



RHI scan of a convective storm at 21:09:14 UTC seen along 282.5 deg azimuth. Reflectivity and Hydrometeor Classification fields are shown.



Storm core magnified. Dual pol spectra of regions above the core (1), at the core (2) and below the core (3) are studied



## Observations

- Hydrometeor classification algorithm [2] performed on the radar data showed presence of different types of hydrometeors including rain, hail, large drops, mixture of rain & hail, snow, graupel and dendrites. Spectral analysis were done at different range bins and the properties are reported.
- Spectral broadening and bi-modal spectra are observed in S(Z<sub>H</sub>) regions of rain mixed with hail/graupel
- Slope in S(Z<sub>dr</sub>) indicates size sorting in hail

## Conclusion

Spectral polarimetry can be used to characterize the microphysics and dynamics of a storm at a particular radar resolution volume. Spectral properties reveal important information about the microphysics of a storm observed by a dual-pol weather radar during the RELAMPAGO campaign.

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## References

- [1] Wang, Y., T. Yu, A.V. Ryzhkov, and M.R. Kumjian, 2019: Application of Spectral Polarimetry to a Hailstorm at Low Elevation Angle. J. Atmos. Oceanic Technol., 36, 567–583, <https://doi.org/10.1175/JTECH-D-18-0115.1>
- [2] Bechini, R. and V. Chandrasekar, 2015: A Semisupervised Robust Hydrometeor Classification Method for Dual-Polarization Radar Applications. J. Atmos. Oceanic Technol., 32, 22–47, <https://doi.org/10.1175/JTECH-D-14-00097.1>