



# Comparison of GLM with VHF Broadband Interferometry in 2018

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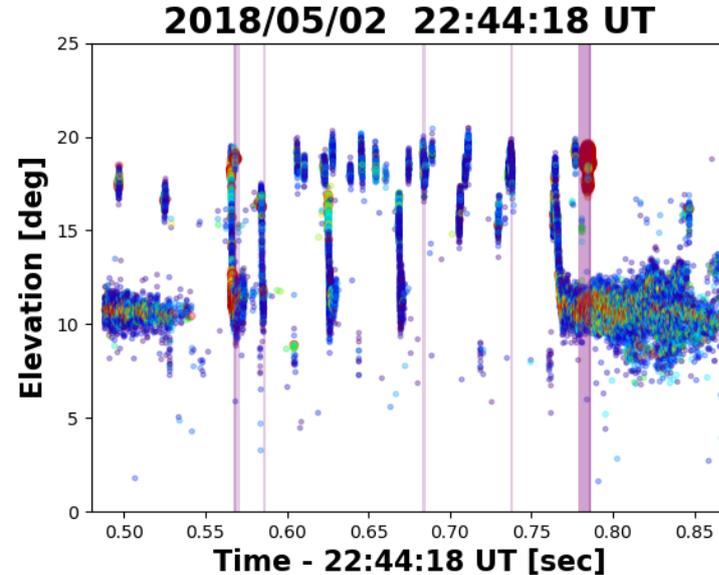
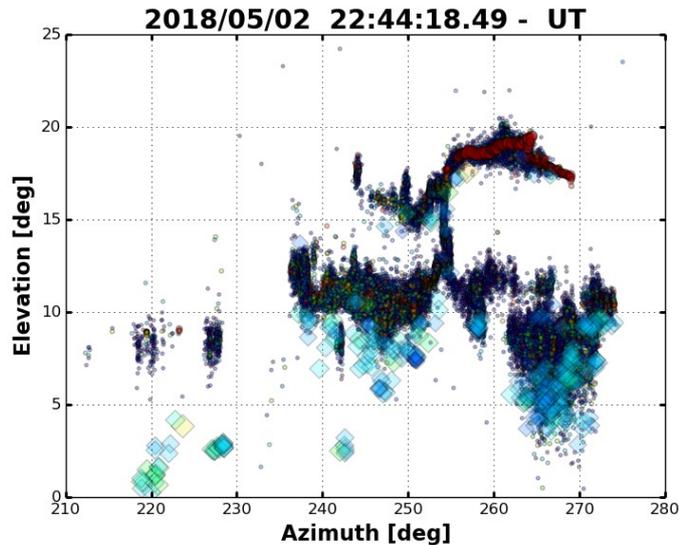
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# 2018 - Oklahoma Campaign

- **April 27 – June 30**
- Deployed in a storage shed at the El Reno Regional Airport (see picture at right)
- Located at the NW edge of the central OK LMA
- Baselines: 80 meters
- Data: ~36 TB (*>25k flashes*)



# Inverted Intracloud Example



- K-changes start in the upper level with some propagating into the lower level (opposite of normal IC)
- Some K-changes detected by GLM are only in the upper level

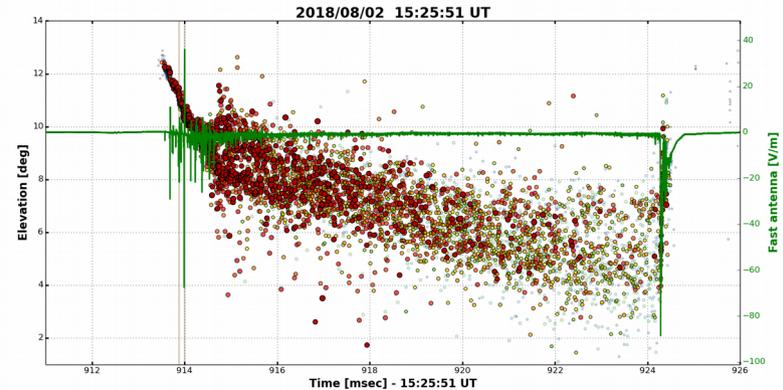
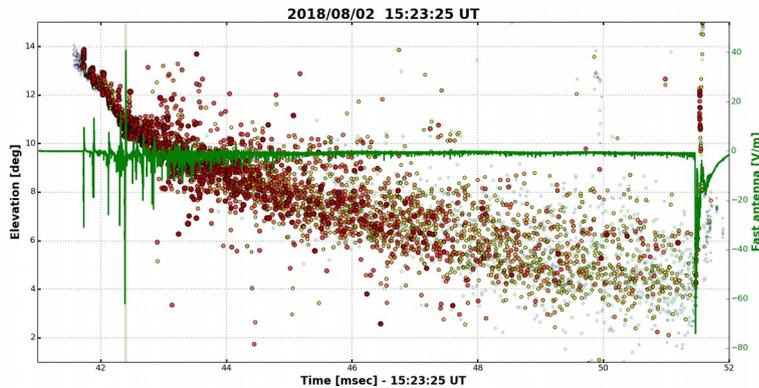
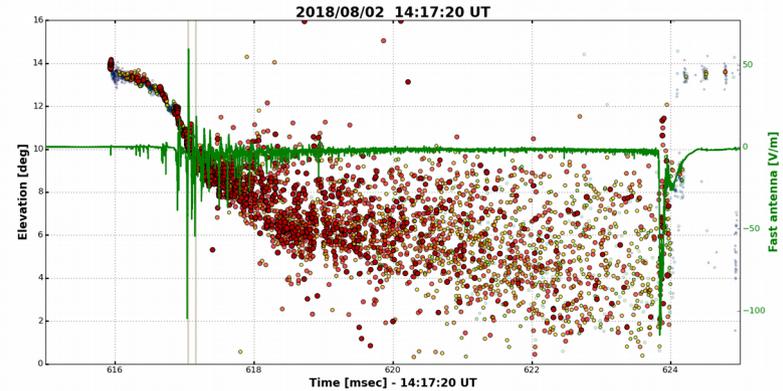
# 2018 - Utah Campaign

- **July 26 - present**
- Deployed near Delta, just east of gamma-ray telescope array
- Main goal: obtain detailed data of terrestrial gamma-ray flashes (TGFs)
- Baselines: 106-121 m

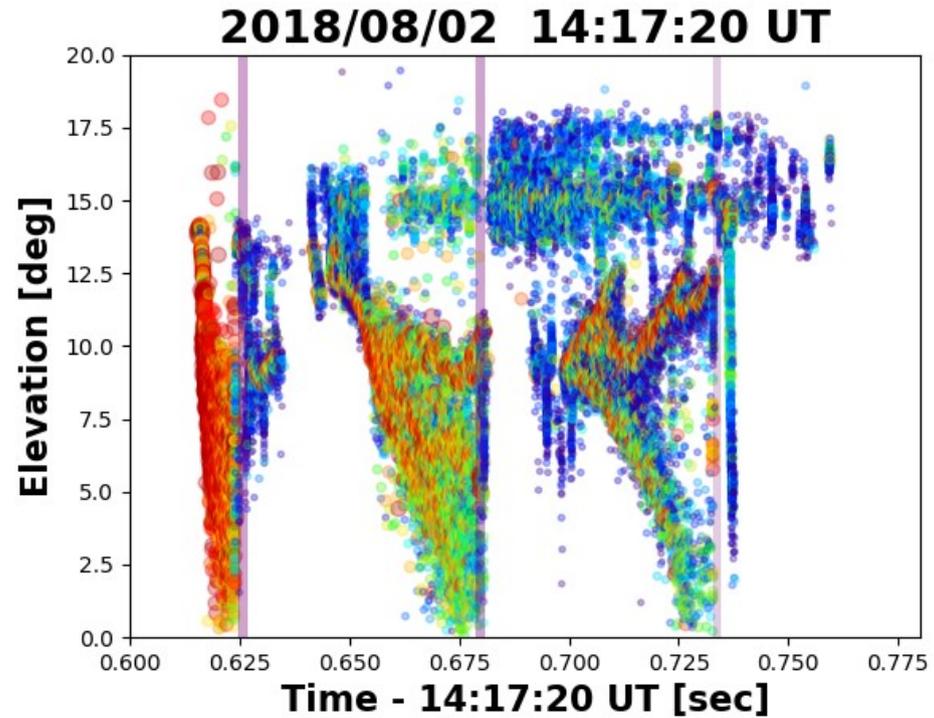
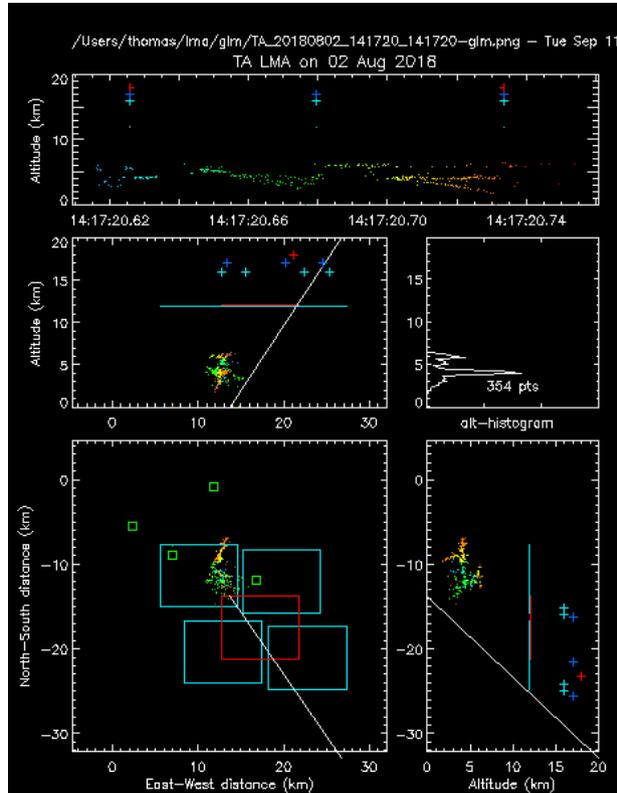


# August 2, 2018 - TGFs

- TGFs detected from energetic low altitude (~3 km AGL) initial breakdown pulses (IBPs) in 3 -CG flashes

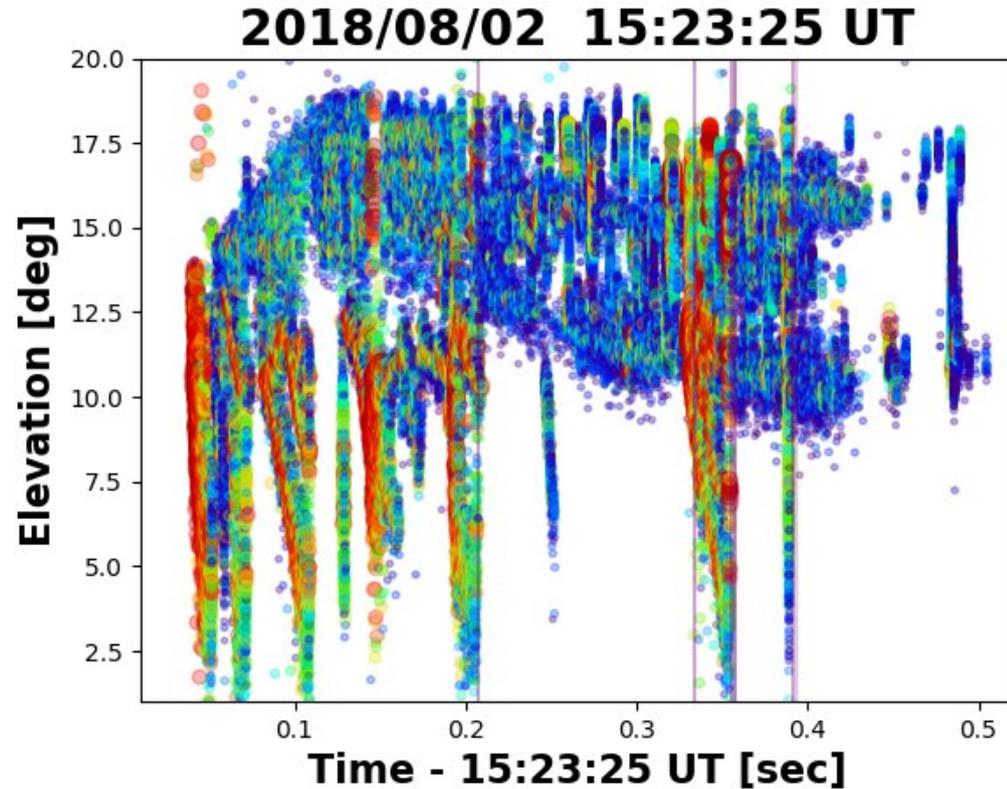
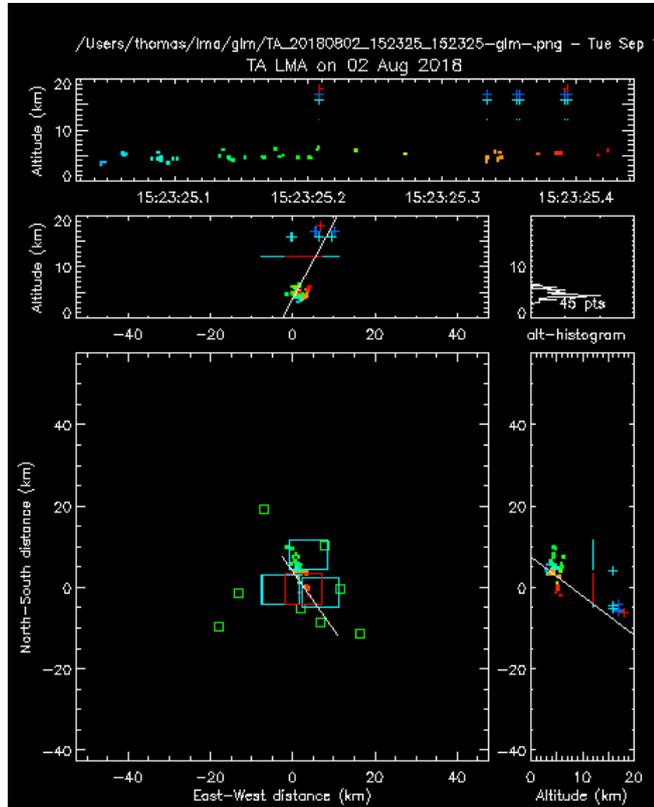


# August 2, 2018 – GLM data for TGFs?



- IBPs not detected by GLM or an event was pitched (initial)

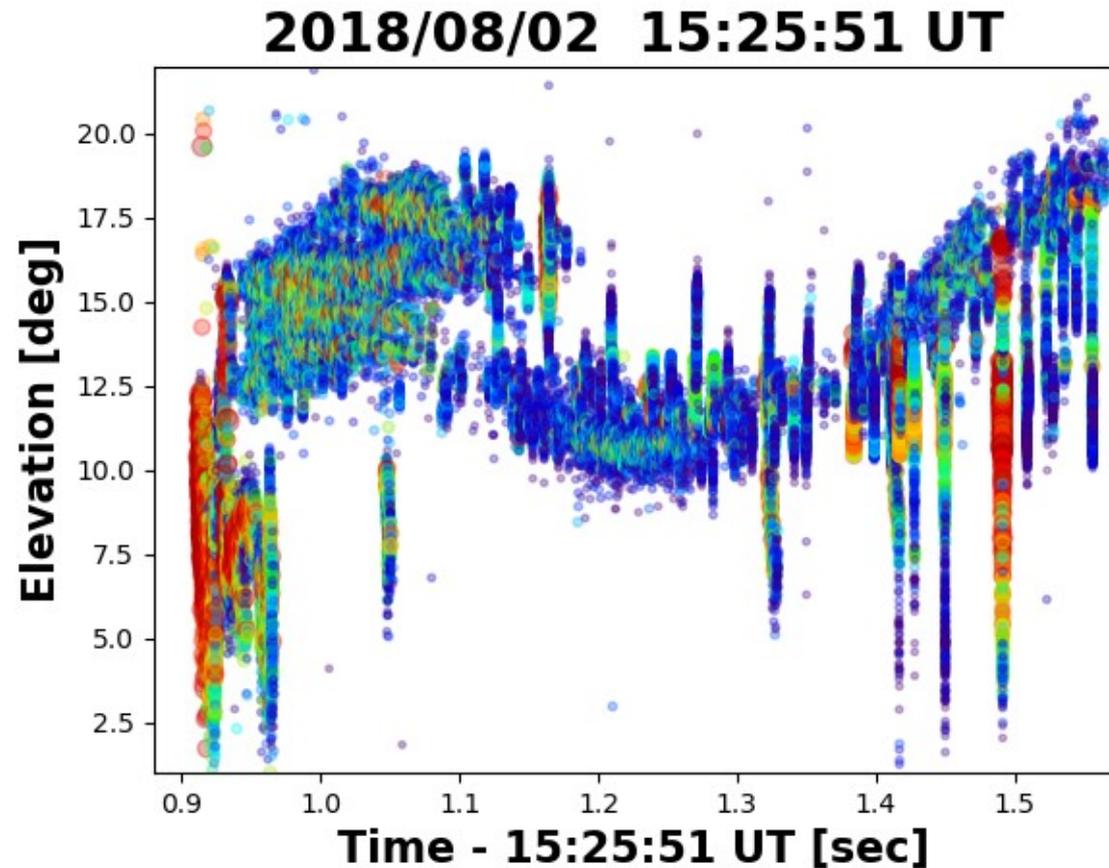
# August 2, 2018 – GLM data for TGFs?



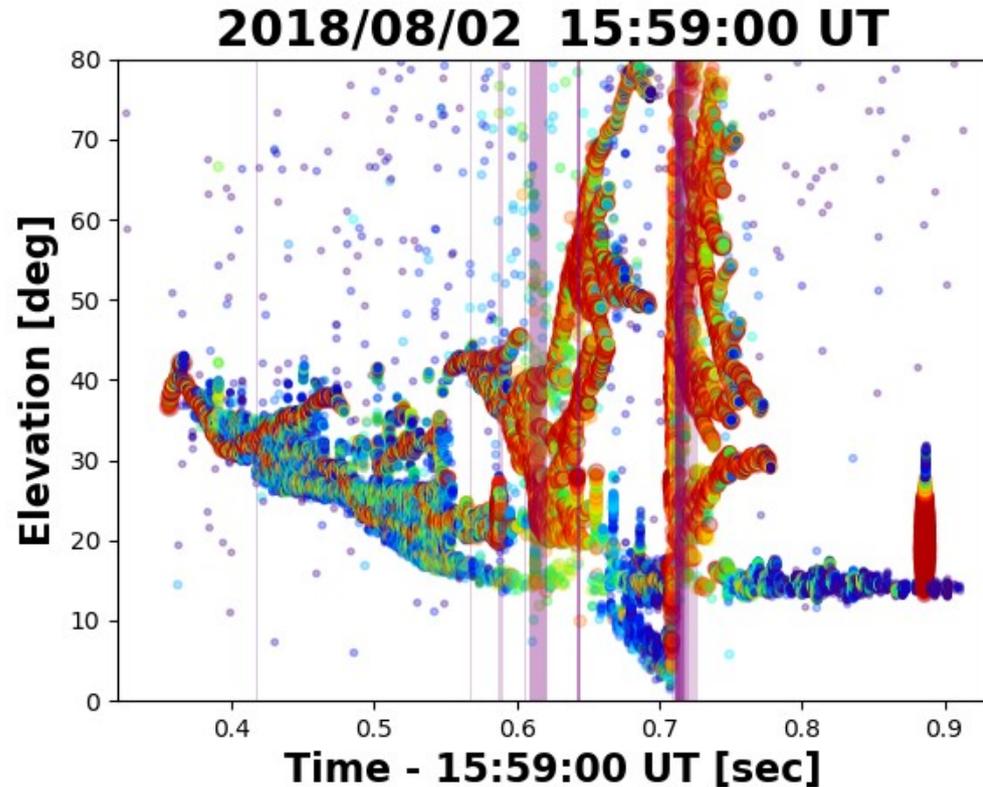
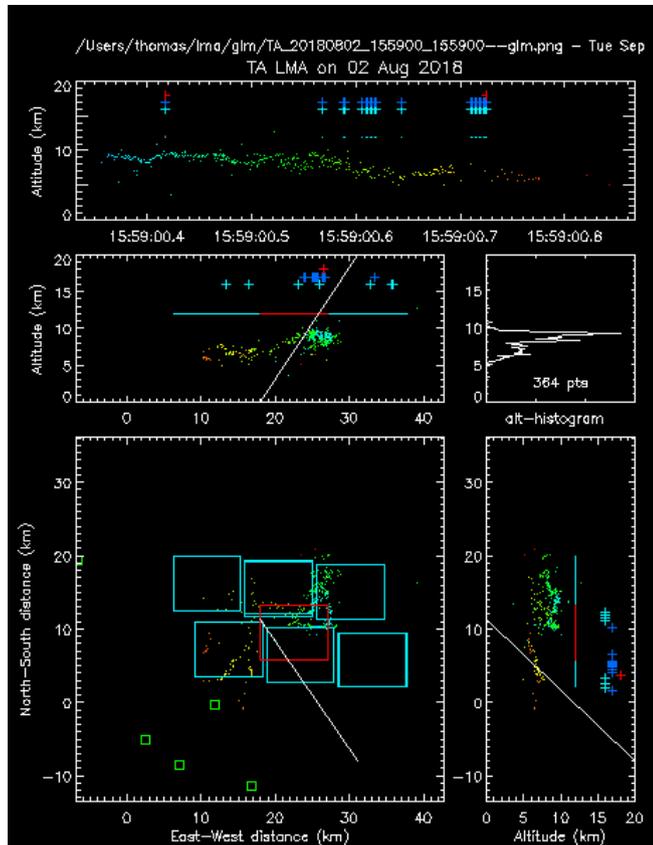
- Initial stroke “missed” as well as several others

# August 2, 2018 – GLM data for TGFs?

- Entire flash is missing from GLM data



# August 2, 2018 – GLM data for a +CG flash



- Burst of events before +CG as well as after stroke

# Summary

- Oklahoma campaign:
  - Inverted ICs observed with K-changes detected in upper levels
  - Very active lightning in supercells and lines of severe thunderstorms was observed. Analysis is ongoing
- Utah campaign:
  - TGFs detected at ground from low altitude IBPs. One of three TGF parent flashes was missed by GLM
  - A significant number of GLM events are associated with negative leader horizontal branching