

# Early results from the RELAMPAGO Lightning Mapping Array

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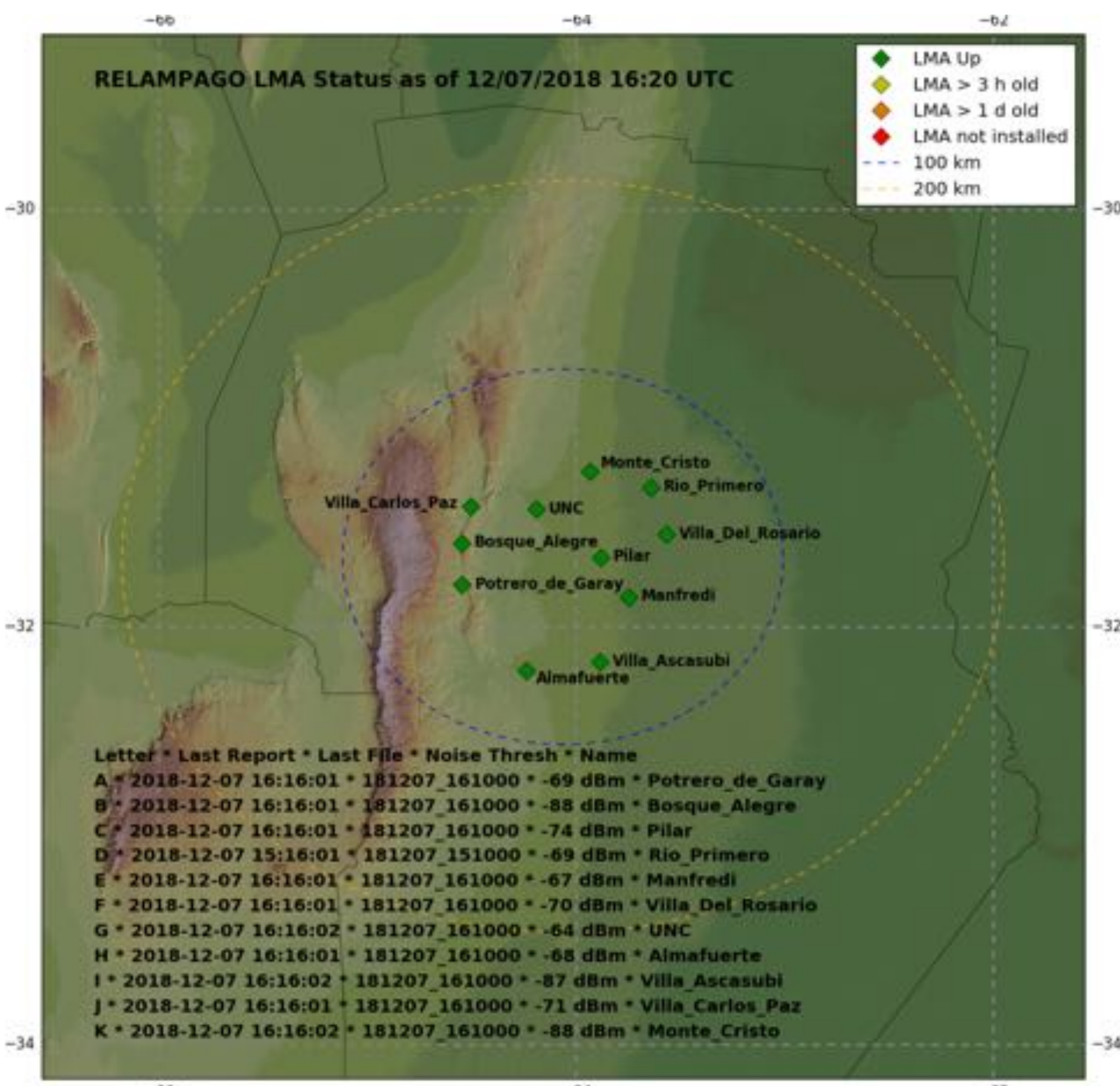


## 1. Introduction

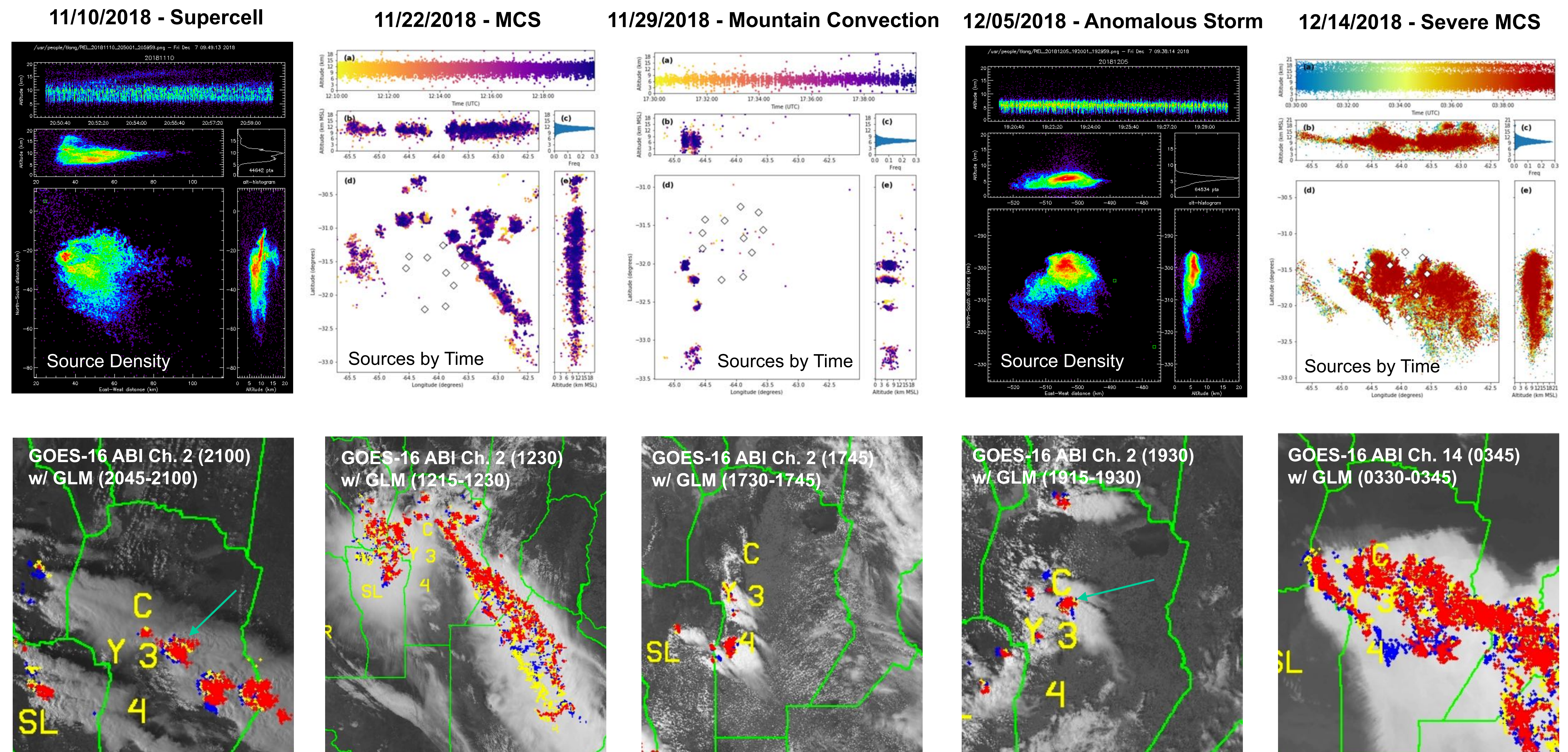
- RELAMPAGO (Remote sensing of Electrification, Lightning, And Mesoscale/microscale Processes with Adaptive Ground Observations) is a National Science Foundation (NSF) field campaign to understand intense and severe convection in central Argentina, near the Sierras de Cordoba mountain range.
- In order to address RELAMPAGO science goals, as well as to assist with ground validation of the Geostationary Lightning Mapper (GLM) instrument on the GOES-16/17 satellites, NASA Marshall Space Flight Center (MSFC) has installed an 11-station Lightning Mapping Array (LMA) in this region.
- The LMA supported the Enhanced Observing Period (EOP) of RELAMPAGO, and then is continuing operations until mid-late April 2019.

## 2. Network Status

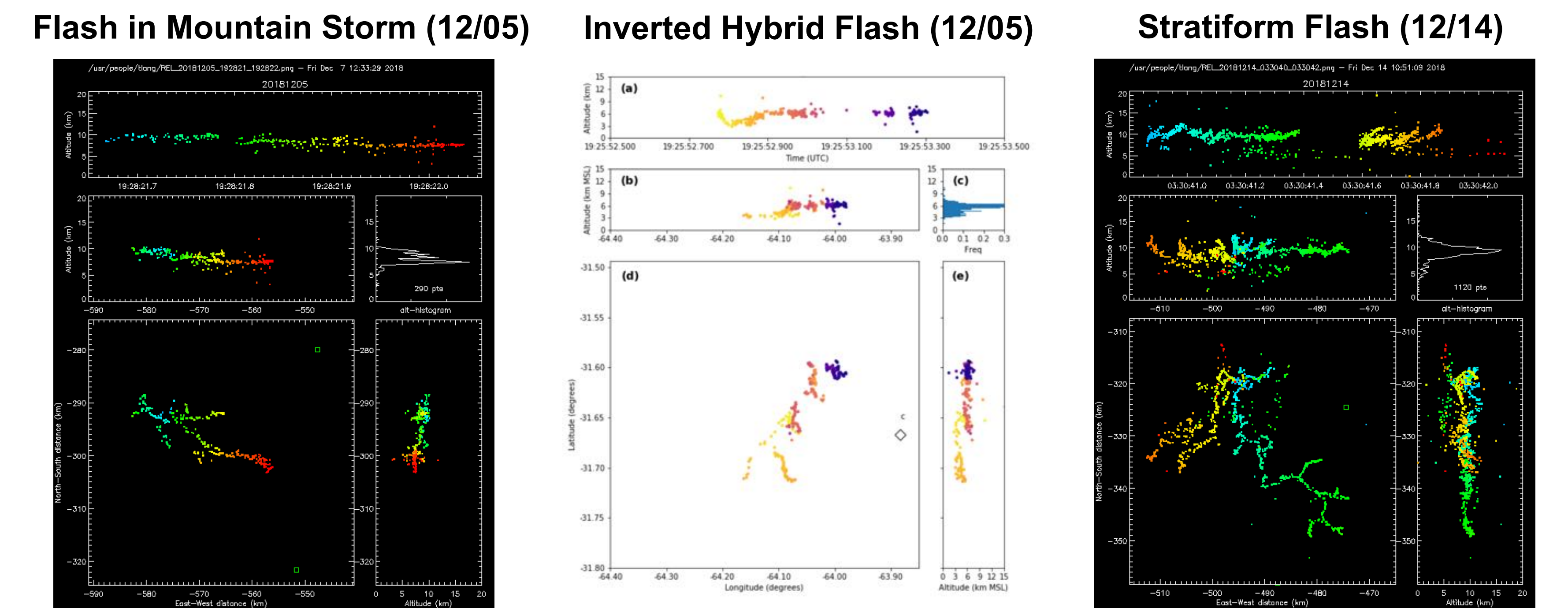
- The RELAMPAGO LMA was installed during 10/24-11/14/2018, with valid data starting by 11/7.
- Each station is remotely accessible via CloudGate modem, and health is routinely monitored.
- Data are downloaded and processed occasionally to ensure scientific quality.
- Periodic maintenance visits.



## 3. Data Examples and Qualitative Comparisons with GLM



- Work continued on the LMA throughout November and early December 2018, which has led to improved VHF source rates and network performance.
- Notable cases to date include a supercell with overshooting top lightning and a lightning hole near the apparent updraft, multiple MCS passages (incl. a severe MCS with overshooting tops), garden-variety mountain convection, and even evidently anomalously charged thunderstorms.
- Source rates have improved significantly since the first couple weeks, and sub-flash processes are readily visible when examining individual flashes



## Acknowledgments

Funding for the RELAMPAGO LMA was provided by NOAA GOES-R Cal/Val project via a reimbursable agreement with NASA MSFC. Bill Rison and Dan Rodeheffer are gratefully thanked for providing technical consultation during network troubleshooting. Michael Solomon and Joy Marich assisted with the LMA station prep work at the NSSTC. Phil Bitzer, Rodolfo Pereyra, and Bruno Medina assisted with installation and maintenance.

## 4. Conclusions

- RELAMPAGO LMA has been in operation since November 2018; bandwidth allows network health monitoring, as well as occasional full-rate processing
- Network improved significantly during its first month, and has already captured a wide variety of convection
- Qualitative correspondence to GLM is noted, and the LMA's ability to map 3D structure has enabled observations of many interesting phenomena already