Title: GTRI Lightning Mapping Array Data - Raw

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1.0 Data Set Description

- Introduction: Lightning Mapping Array (LMA) sensors were deployed at pre-designated locations for each IOP. The array consisted of up to 8 GTRI sensors (Units N-X), 8 NSSL sensors (Sites 1-8) and 1 TTU sensor, as listed in each Level 1 file header. The network was operated by Georgia Tech Research Institute, National Oceanic and Atmospheric Administration / Office of Atmospheric Research / National Severe Storms Laboratory and OU / CIWRO staff with invaluable assistance from SUNY Oswego faculty and students. Data set includes Level 0 (raw binary) files for each GTRI station.
- Creation date: 27 June 2023
- Data Status: Final
- Time period: All data between 26 September 2022 - 2 April 2023 from the GTRI sensors.
- Physical location of the measurements: All sensor locations centered around 43.59, -75.72 as listed below and in each Level 1 file header surrounding the New York Tug Hill Plateau
    - Sta_info: N UNIT_N 43.8399011 -75.4290750 215.63
    - Sta_info: R UNIT_R 44.0405522 -75.8609833 136.85
    - Sta_info: S UNIT_S 43.5524731 -76.1223458 104.30
    - Sta_info: T UNIT_T 43.4380567 -75.2255694 337.83
    - Sta_info: U UNIT_U 43.9892703 -76.0237369 73.12
    - Sta_info: V UNIT_V 43.3682175 -75.9103411 194.93
    - Sta_info: W UNIT_W 43.3345047 -75.1781767 357.42
    - Sta_info: X UNIT_X 43.8612794 -76.0149547 158.52
- Data file intervals: 10 minutes

2.0 Instrument Description

- Each sensor records the timing and amplitudes of passively-received VHF (76-82 MHz) emissions by lightning (and any other sources) in 80 microsecond windows.
- Instrument photos:

GTRI sensor X at Adams Center, NY, 20 Sept 2022

3.0 Data Collection and Processing

- Data was collected from each sensor remotely throughout the project period

4.0 Data Format

Binary files compressed with gzip of all VHF records per ten-minute period generated by rev4 LMA boards from LMA Technologies, LLC. File naming follow a L[station letter]_NGLMA_unit_[station letter]_[yymmdd]_[HHMMSS].dat.gz naming convention

5.0 Data Remarks

- PI's assessment of the data:
    - Occasional dropouts of individual sensors occurred during the operational period. These dropouts were addressed by resets of these sensors. This lead to occasional daily data sets with less than a full complement of data.
    - No data exists for 17 October 2022.
    - GTRI sensor N at Duflo Airport experienced hardware issues and was sent back to GTRI for repairs. It was offline between 5 Oct 2022-10 Jan 2023. It was back online 11 Jan 2023-11 Feb 2023.
    - Maintenance of individual GTRI sensors ceased after 2 February, so array solutions may become sporadic after that date.

6.0 References

- Chmielewski, V. C., and Bruning, E. C. (2016), Lightning Mapping Array flash detection performance with variable receiver thresholds, J. Geophys. Res. Atmos., 121, 8600–8614, doi:10.1002/2016JD025159.
- Thomas, R. J., Krehbiel, P. R., Rison, W., Hunyady, S. J., Winn, W. P., Hamlin, T., and Harlin, J. (2004), Accuracy of the Lightning Mapping Array, J. Geophys. Res., 109, D14207, doi:10.1029/2004JD004549.

7.0 Appendix

- Keywords: Atmospheric Electricity, Lightning, Lightning Mapping Array, Thunderstorm

- Alternate data access: Processed data are also archived at https://data.nssl.noaa.gov/thredds/catalog/WRDD/OKLMA/deployments/LEE/catalog.html

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