Insights from Geostationary Lightning Mapper Gridded Products

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Abstract

The first year of Geostationary Lightning Mapper (GLM) gridded products are analyzed to explore diurnal and seasonal trends, investigate regional distributions, and examine relationships between different gridded products. Level 2 GLM files report event, group, and flash locations which are processed into gridded products are re-navigated to the 2×2 km Advanced Baseline Imager fixed grid. Broad spatial coverage and rapid temporal updates make the gridded products well-suited for weather forecasters. Three gridded GLM products are available to National Weather Service (NWS) forecasters (since July 2018). For each grid cell and time period, the Flash Extent Density (FED), Average Flash Area (AFA), and Total Optical Energy (TOE) report the number, average area, and optical energy sum for all spatially coincident flashes. One minute gridded products are composited to report daily and seasonal results for the contiguous United States during July 2018 – June 2019. Histograms and spatial maps illustrate the geographical and temporal variability of lightning occurrence and characteristics. Statistical distributions provide context for meteorologists seeking to apply these data. This knowledge can be used to better diagnose thunderstorm evolution and the direct threat lightning poses to people and property.

Topic Areas

Lightning and Weather, Lightning Climatology

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