

Toward an operational use of stroke level lightning data in severe weather forecasting

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Abstract:

While current research has focused on the use of ash counts as a proxy for convective development, in general there is more information available in lightning data. In particular, using strokes may provide an opportunity to more fully exploit lightning data in applications of operational forecasting. Fundamentally, there are more strokes than ashes, providing a possible way to utilize this data in a more time efficient manner. Further, each ash, and each stroke, neutralize different amounts of charge. The amount of charge neutralized is related to the charge generated by a storm, which in turn is related to the updraft strength. With the launch of the Geostationary Lightning Mapper (GLM), time continuous measurements of stroke level data will be available across an unprecedented spatial extent. Hence, there exists a need to explore the use of stroke level data in lightning applications, in particular in the forecasting of severe weather. This proposal will investigate the use of this data and related energetics. Further, it will provide a framework in which the relationship of this data in the overall storm development can be explored theoretically, providing further justification for the use of lightning data in operational forecasting.