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Title: A summary of the NASA Lightning Nitrogen Oxides Model (LNOM) and recent results.

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Abstract

The NASA Marshall Space Flight Center introduced the Lightning Nitrogen Oxides Model (LNOM) a couple of years ago to combine routine state-of-the-art measurements of lightning with empirical laboratory results of lightning NOx production. The routine measurements included VHF lightning source data [such as from the North Alabama Lightning Mapping Array (LMA)], and ground flash location, peak current, and stroke multiplicity data from the National Lightning Detection Network™ (NLDN). Following these initial runs of LNOM, the model was updated to include several non-return stroke lightning NOx production mechanisms, and provided the impact of lightning NOx on an August 2006 run of CMAQ. In this study, we review the evolution of the LNOM in greater detail and discuss the model's latest upgrades and applications. Whereas previous applications were limited to five summer months of data for North Alabama thunderstorms, the most recent LNOM analyses cover several years. The latest statistics of ground and cloud flash NOx production are provided.