

Abstract Submitted  
for the 4CF12 Meeting of  
The American Physical Society

**Intracloud Lightning Flashes Can Be Similar in Detail**<sup>1</sup> RICHARD SONNENFELD, WILLIAM WINN, Physics Dept & Langmuir Lab, New Mexico Tech, GAOPENG LU, ECE Dept, Duke University, HARALD EDENS, STEVEN HUNYADY, JEFF LAPIERRE, Physics Dept & Langmuir Lab, New Mexico Tech — The unpredictable shape of the channel from cloud to ground in lightning is well known. However, when we mapped repeated intra-cloud (IC) lightning flashes, we in some cases see a repeatable path over 15 minutes. A storm, on 8/18/2004 near Langmuir Lab in New Mexico, spawned six flashes between 19:52:30 and 20:06:41 UTC exhibiting remarkable similarity. When corrected for winds (i.e., when shown in a coordinate system relative to their air-parcel) all flashes originated within a roughly 1 km radius. We introduce “lightning nursery” to describe these fecund regions of atmosphere. The first three of these flashes were the most similar. They formed branching structures roughly 30 km in size in which the branches coincided with each other over substantial lengths to a precision of a kilometer. Several conclusions can be drawn from this. 1) When the pre-flash electric field is sufficiently strong, the distribution of charge in a thunderstorm completely determines the path of the flash, over tens of kilometers. 2) Over a period of a couple of minutes, a storm recharges itself to a very similar configuration. 3) This observation validates the use of lightning mapping techniques to deduce the charge structure of storms not just as layers, but as 3-dimensional forms.

<sup>1</sup>Work performed with NSF funding thru CMG, ATM divisions.

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Date submitted: 24 Sep 2012

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