

## ***Interactive comment on “Lightning activity in Brazilian thunderstorms during TROCCINOX: implications for NO<sub>x</sub> production” by H. Huntrieser et al.***

### **Anonymous Referee #2**

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The manuscript by Huntrieser et al. is a very comprehensive examination of the electrical and chemical nature of two storms from the TROCCINOX experiment, one tropical and one subtropical. The paper compares in great detail the aircraft measurements and the lightning observations for these two storms, and attempts to explain the differences. The subtropical event appeared to produce more NO per lightning stroke than did the tropical event. Given that peak current has been shown to be related to NO production in lab research, the authors proceed to analyze the peak current from the LINET network deployed in TROCCINOX. Peak current has also appeared to be related to NO production in storms that have been analyzed with cloud resolving models by other researchers. However, recent experimental results from Florida have shown

with rocket-triggered lightning that it is the continuing current phase of a lightning flash that is responsible for most of the NO production (Rahman et al., 2007, GRL). I have spoken with two other atmospheric electricians, and they have concurred that it is most likely the continuing current phase that is important for NO production, and that the peak current of the return stroke should not be all that important. The authors should mention in this manuscript the Rahman et al work, and perhaps downplay the discussion of peak current. The hypothesis concerning flash length as the main reason for greater NO production per stroke in midlatitude and subtropical storms than in tropical events, and the related hypothesis that the length is related to vertical wind shear, are exciting developments for further research. As such, this paper should be published in ACP.

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 14813, 2007.

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