

Interactive comment on “Chemistry of sprite discharges through ion-neutral reactions” by Y. Hiraki et al.

Y. Hiraki et al.

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We appreciated the valuable suggestions from Dr. Millan-Valle. We carefully read his comments and could modify our manuscript accordingly. Our response to the comments are described in order as follows.

1. According to his comment, we included information on the characteristic timescale as "10–100 ms", the frequency and the active region of their occurrence as "tens or more of events can occur during one night, especially in the Africa as clearly identified by FORMOSAT-2 satellite observations" at the 1st paragraph in Section 1.
2. We included a discussion on comparison with results of Arnone et al. (GRL 2008) according to his comment as well as the previous comment from reviewer I.
3. According to his comment, we tried to make clear the corresponding part as follows.

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"Leading to the removal of harmful components in atmospheric pressure, streamer corona is expected to be one of useful tools for flue gas cleaning; technological application is promoted since it causes no significant gas heating (Kulikovsky, 1997)."

4. We appreciated his comment that the reactions are separated from the text. But, we tried to write some of them in the text to emphasize the key reactions (separated from text), although trying to examine again.

5 & 6. According to his comment, we included the phrase as

"The reason we focus the nighttime impact is that the NO density is quite low at night as shown above, making easy to detect a perturbation by a streamer. However, it is difficult to be detected in the daytime case because the ambient density of NO, as well as that of NO₂, is comparable with the perturbation estimated above."

at the end of 3rd paragraph in Section 1.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 2311, 2008.

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