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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "Measurements of electric charge separated during the formation of rime by the accretion of supercooled droplets" *by* R. A. Lighezzolo et al.

**Anonymous Referee #1**

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1. It is well documented from the time of Reynolds (1957),Jayratane et al., (1983) etc. that droplets alone colliding with a rimed target did not separate charge. See review by Saunders (1994). The only exception was by Keith and Saunders (1989) where they detected positive charging of graupel at all temperatures for higher impact velocities. They attributed this spurious charging to breakup of rime from target. Can the authors comment on the main difference between the present experiments and experiments by others who did not see droplet charging. It is very unlikely that Hallet-Mossop type of splintering was not happening in those experiments.

2. In the present experiments, what were the precautions taken to ensure that rime



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was not falling from the roof or breaking off from the sidewalls and colliding with the target?

3. How many spurious events were there when the upstream induction ring detected charge?

4. What is the temperature gradient between upstream and downstream of the target?

5. In the present experiments of 500 s the vapor supply was cut off after 300 s and the authors say that significant charging was occurring only when riming was going on. Does that mean that some charging was still going on in the next 200 s. How was the droplet spectrum after the vapor supply was cut off.

6. What is the sensitivity of the amplifier. For 2fc of charge how much was the amplifier output (mv). I did not find this in the earlier paper which the authors have referred to.

7. The location where the air speed is measured is not specified in the Figure.

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Interactive comment on Atmos. Chem. Phys. Discuss., 9, 23349, 2009.