

Numerical simulation of positive streamer development in thundercloud field enhanced near raindrops - DTU Orbit (09/11/2017)

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As the threshold field strength for the breakdown in air significantly exceeds the maximum measured thundercloud strength 3 kV/cm/atm, the problem of lightning initiation remains unclear. According to the popular idea, lightning can be initiated from streamer discharges developed in the enhanced electric field in a vicinity of hydrometeors. To test the idea, we carry out numerical simulations of positive streamer development around charged water drops at air pressure typical at thundercloud altitudes and at different background fields, drop sizes and charges. With real drop sizes and charges, the electric field required for the streamer formation is stronger than the measured fields; therefore, second mechanism is required to amplify the local field.

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