

## A comparison between the observed characteristics of positive and negative leaders

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All lightning discharges begin with various leader discharge processes. Although these processes are very important in lightning physics, they are still poorly understood. In this study, we have performed a measurement of the correlated sub-microsecond E-fields, electric current and high-speed images of leader discharges that are initiated from a windmill and its lightning protection tower. It was found that positive leaders are much more easily to be initiated than their counterparts of negative leaders. During our observed period of the last 4 winter seasons (from 2005 to 2008), positive leaders occurred roughly 10 times more frequent than the negative leaders. Both positive and negative leaders usually exhibit a rapid increase in their electrical current to an order of 10 kA within the first 2 ms and also contain a number of pulses in their initial stages. However, pulses contained in negative leaders are much denser than that in positive leaders. In the final presentation, we will report the detailed characteristics of these pulses as well as our suggestions to explain these observed results.