

**Title: New Evidence on the Diurnal Variation of Peak Current in Cloud to Ground Lightning**

**Session:** Thunderstorm Charges and Currents

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Using data from the U.S. National Lightning Detection Network, this study provides novel evidence on the diurnal variation of the Cloud-to-Ground lightning flash peak current over the continental U.S. Over the continental U.S., areas with marked diurnal flash activity differences, portray a consistent peak current variability closely resembling to a quasi-sinusoidal behavior reaching maxima a few hours after local dawn followed by decreasing magnitudes, reaching minima during the local afternoon. Given the lack of supporting literature this study explores several physical mechanisms as potential candidates that can drive the observed flash peak current diurnal behavior.