Simultaneous High-Speed Camera and Geostationary Lightning Mapper (GLM) Observations of Cloud-to-Ground Lightning

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Optical emissions from natural cloud-to-ground (CG) lightning flashes in the Washington, DC metropolitan area are measured using two Phantom high-speed camera systems and the GLM sensor on the GOES-16 satellite during summer 2017. Important insights are gained by observing CG flashes from the side using the Phantom cameras simultaneously with the top-down view provided by GLM. The GLM response to visible processes of the CG flashes that are evident to the phantom cameras at 2500 frames per second are assessed. These features include individual return strokes, interstroke intervals, and continuing currents. The optical measurements from GLM and the Phantom cameras are compared with observations from the National Lighting Detection Network (NLDN) and the Washington D.C. Lightning Mapping Array (DCLMA) to gain additional perspective. Several cases of interest are shown to illustrate the value of these types of coincident observations.

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