Importance of Flash Area and Total Optical Energy

Lightning is a broadband emitter that is detectable across multiple frequencies. One of the challenges in using lightning “flashes” are that there are different definitions for a flash, which are entirely dependent upon the instrument making the measurement.

However, GLM provides two metrics which provide insight into the kinematic state of the parent cloud producing the lightning. These are flash area and flash energy.

Bruning and MacGorman (2013; right) provides theoretical basis for the use of flash area and flash energy in assessing convective state. In areas where there are weaker updrafts, larger flashes with more energy are generally found. Where there are strong, turbulent updrafts (e.g., supercell), smaller, less energetic flashes are observed.

The purpose of this poster is to demonstrate how this flash area and energy relationship spans multiple convective regimes and can help the forecaster assess the kinematic state of the cloud to aid in operational decision making.