



Lightning-based Estimates of Ice-phase Precipitation Rates

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It has become increasingly accepted that electrical energy generation in thunderclouds results from charge exchanged during collisions between ice crystals and precipitable ice such as grauple and small hailstones. These charged hydrometeors then separate in the up draft resulting in the growth of strong electric fields. Further, since lightning dissipates a large majority of this electrical energy, it follows that lightning and ice formation should be related. In fact, it has been hypothesized that there should be a linear relationship between lightning flash rates and ice generation. A number of case studies seem to support this hypothesis and extensive analyses of TRMM radar and lightning data have established a strong correlation between lightning flash rates and the quantity of precipitating ice.

If a quantitative relationship between lightning and ice-phase precipitation can be established, then with the advent of the Geostationary Lightning Mapper era, it will be possible, for the first time to make continuous ice-phase precipitation measurements over a complete storm's life cycle.