

Electric Field Measurements during the Genesis and Rapid Intensification Processes (GRIP) Field Program

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During the Genesis and Rapid Intensification Processes (GRIP) field program, a system of 6 electric field mills was flown on one of NASA's Global Hawk aircraft. We placed several mills on the aircraft to enable us to measure the vector electric field. We created a distributed, ethernet-connected system so that each sensor has its own embedded Linux system, complete with web server. This makes our current generation system fully "sensor web enabled." The Global Hawk has several unique qualities, but relevant to quality storm electric field measurements are high altitude (20 km) and long duration (20-30 hours) flights. There are several aircraft participating in the GRIP program, and coordinated measurements are happening. Lightning and electric field measurements will be used to study the relationships between lightning and other storm characteristics. It has been long understood that lightning can be used as a marker for strong convective activity. Past research and field programs suggest that lightning flash rate may serve as an indicator and precursor for rapid intensification change in tropical cyclones and hurricanes. We have the opportunity to sample hurricanes for many hours at a time and observe intensification (or de-intensification) periods. The electrical properties of hurricanes during such periods are not well known.

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