



Lightning-Wind Intensity Relationship in Hurricanes

C. Price (1), M. Asfur (2), and Y. Yair (2)

(1) Tel Aviv University, Department of Geophysics and Planetary Science, Tel Aviv, Israel (cprice@flash.tau.ac.il, +972 3 640.9282), (2) The Open University of Israel, Ra'anana, Israel (asfur@gmail.com, yoavyair@gmail.com)

Hurricanes are Earth's most deadly storms, causing tremendous devastation around the globe every year. While forecasters are quite successful in predicting the trajectories of hurricanes days in advance, hurricane intensification or weakening is less accurately predicted. In this paper we present evidence that the maximum sustained winds (and minimum pressures) in hurricanes are preceded by increases in lightning activity one day before the peak winds. This is the first study to track lightning activity in 58 hurricanes around the globe, during their entire lifetimes. All these hurricanes showed highly significant positive correlations between lightning activity and maximum sustained winds, with a mean correlation coefficient of 0.81. We suggest that increases in lightning activity in hurricanes may be related to enhanced convection during the process of eye-wall replacement, known to be related to hurricane intensity changes. Since lightning activity can now be monitored continuously in hurricanes at any location around the globe, lightning data may contribute to better hurricane intensification forecasts in the future.