Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)

HTT08-02 Room:203 Time:May 20 09:15-09:30

Lightning in Typhoons

PRICE, Colin[1*], Barry Lynn[2], Yoav Yair[3], Naama Reicher[1], Alexander Khain[2]

[1]Department of Geophysical, Atmospheric and Planetary Sciences, Tel Aviv University, Israel, [2]Hebrew University of Jerusalem, [3]The Open University of Israel

We have recently shown that lightning observations in intense typhoons precede the maximum intensity of the storms by approximately 30 hours. In this presentation we further this study by modeling the lightning activity in typhoons using the Weather Research and Forecasting (WRF) meso-meteorological model. The WRF model successfully simulates the growth and decay of typhoons, and accurately forecasts their development, tracks and intensities. The modeled lightning scheme correctly predicts that the maximum lightning activity occurs before the maximum sustained winds of the storms, with a similar lag of 30 hours as shown in the observations. In addition, the model simulations show that the location of the maximum lightning activity migrates from the outer bands of the typhoon toward the eye during intensification, with the maximum lightning activity closest to the eye approximately 12 hours before the maximum intensity of the hurricane. It is suggested that a sharp increase in forecast lightning, and the inward migration of the lightning maximum, can serve as markers from which to gain greater confidence in predictions portending further intensification of typhoons or conversely their decay.

Keywords: lightning, typhoon, VLF, model