



Predicting Thunderstorm Development Through Infra-Red Satellite Images

C.A. Morales (1) and L.A.T. Machado (2)

(1) University of São Paulo, São Paulo, Brazil, (2) National Space Research Institute, São Paulo, Brazil (morales@model.iag.usp.br / Fax: +55 (11) 30914714 / Phone +55 (11) 30912711

This study presents a now-casting tool that predicts the spatial and temporal development of thunderstorms and the probability of cloud-to-ground (CG) discharges. This work is based on the cloud tracking algorithm (FORTRACC) that has been operationally implemented at the Center of Weather and Climate Prediction – CPTEC of Brazil, which has a new version that incorporates the observations of CG lightning observations of the Brazilian Lightning Network (RINDAT). During the development of the algorithm it has been found that the growth rate (cloud-area expansion) is related to the development of thunderstorms and its lifetime duration. Moreover, the lifetime grow-rate and cloud area have a correlation with the CG-frequency. These dependencies were evaluated and it was found that the small convective systems have the higher CG-frequency per cloud area, and the lightning frequency is a function of the lifetime stage. In this work, we will present these analyses and the evaluation of the new FORTRACC-Electro, i.e., which incorporates the prediction of the thunderstorm evolution and the occurrence of CG lightning.