



Forecasting and tracking of the evolution of cloud cluster (ForTraCC): The technique applied to satellite and the integration with radar and lightning data.

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The relationship between convective system area expansion, at the initiation stage, and the life cycle duration allows this parameter to be used as a tool for nowcasting. The area expansion reaches its maximum value during the initiation stage of the convective systems and later, the upper level wind divergence reaches its maximum, at or just before to the mature stage. The maximum area expansion occurs close to the time of maximum precipitation and about 4 hours before the maximum cold cloud fraction at the same threshold. Also, the area expansion can be used to determine the convective system life stage and to supply information about the condensation processes and the upper level wind divergence. The average area expansion at the initiation stage varies exponentially with the life cycle duration. This work introduces the operational product – FORTRACC (FORecasting and TRACKing of the evolution of Cloud Clusters) used to describe the convective systems life cycle and its nowcasting. The results using GOES IR image and radar CAPPI 3 km are presented to describe the performance of this technique. Finally, it presents the preliminary results of different techniques used by CPTEC for nowcasting, as for example: the combination of IR and WV channel to predict lightning activity, the application of ascend/descend cloud top rate, using weather radar, to forecast the convection intensity and duration of convective cells and the combination of FORTRACC with the information of lightning activity, allowing to describe the evolution of electrical activity during the convective system life cycle.