

Estimated rainfall comparison between weather radar and lightning data based on an sliding-window

Meteorological Applications of Lightning Data

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The CEMADEN is the Brazilian Centre for natural disaster and its main goal is to develop, test and implement a system to forecast natural disasters in vulnerable areas throughout Brazil in order to mitigate the loss of human life during events of natural disasters. For this reason the use of techniques in high resolution (spatial and temporal) on monitoring is fundamental to reach the CEMADEN's goal. Therefore, the weather radar and lightning data are a good combination on monitoring and as a tool of nowcasting of severe weather. In this work we evaluated the performance of an accurate Rainfall-Lightning Ratio (RLR) on the estimation of rainfall from lightning data based on a temporal sliding-window and a fitting function. From this information it is allowed to estimate rainfall from lightning data in areas that lack weather radar coverage. Thereby, we used radar data of different weather radars on South and Southeastern of Brazil and lightning data for the same areas and period of time. It was tested some thunderstorms observed at CEMADEN's monitored risk areas and that resulted on alerts emitted by CEMADEN. The results showed a satisfactory agreement between RLR estimation of rainfall and radar estimated rainfall.