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Now-casting Lightning Clusters in the Mediterranean Region using WDSS-II

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Lightning activity can be detected and monitored continuously from thousands of kilometers away and can therefore be very useful in improving forecasts and now-casts of severe thunderstorms. Thunderstorms are often the cause of severe and disastrous flash floods. And an improvement in the now-casting of such storms can assist in giving better warning to prepare for upcoming storms.

Using the ZEUS ground-based VLF lightning detection network and the Warning Decision Support System – Integrated Information (WDSS-II), we performed now-casting simulations with one year's lightning data over the Mediterranean area. Thousands of lightning clusters were observed and now-casted 30, 60, 90 and 120 minutes ahead. Statistical analysis was then done by calculating hit, miss and false alarm rates, in order to determine the success of the now-casting.

The results show that the model is overall successful in now-casting the location of the lightning clustering, especially when applied to strong and consistent lightning events. The now-casting has a low false alarm rate, which is also beneficial to the goal of flash floods now-casting.

This method has been implemented for the use of real time now-casting and is used to seek and find areas of risk according to lightning intensity and percentage of now-cast success.
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