On using lightning for temporal propagation and cloud-life adjustment of MW-estimated severe precipitation fields

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The close connection between lightning occurrences and convection makes them interesting for nowcasting applications. As a matter of fact, there are weak statistics supporting their widespread use for quantitative precipitation estimation, while the usefulness of information related with the position and frequency of lightning strokes arises forcefully by the visual inspection of maps. On the contrary, microwave-based precipitation retrieval techniques, recognized as good tools to quantify the instantaneous rainfall amount, suffers from low spatial and most low temporal resolution related to the orbital characteristics of the low earth observation (LEO) satellites accommodating MW sensors.

Within the frame of the definition of a Mediterranean real time precipitation monitoring and nowcasting system, the paper will show some preliminary considerations and results derivable by the combined use of those data sources. In particular, here the focus is on the potential to extrapolate the evolution of the AMSU-based instantaneous rainfall maps by applying physical assessments concerning the electrical properties of evolving convective systems derived by available lightning ground network data.