



## **Microwave-lightning cooperation to provide frequent rainfall scenarios of Mediterranean convective storms**

S. Dietrich, F. Di Paola, and A. Mugnai

Institute of Atmospheric Sciences and Climate (ISAC), CNR, Rome, Italy (s.dietrich@isac.cnr.it)

The close connection between lightning occurrences and convection is the foundation of the employment of ground based lightning location networks data as proxies of storms position and evolution. Weak statistics support their direct 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 a good tool to quantify the instantaneous rainfall amount, suffer from low spatial and most low temporal resolution related to the orbital characteristics of the low earth observation (LEO) satellites accommodating MW sensors.

A cooperative microwave-lightning system is developed that exploits lightning network data to propagate rain fields estimated using multifrequency brightness temperatures acquired by AMSU passive radiometers. The method both drives the movement of the rain cells using lightning occurrences as well as modifies the morphology and the intensity of the storm according to the course of spatial and temporal distribution of lightning strokes. The successful application of this method to the analysis of some severe storms included in FP6 project FLASH (Observations, Analysis and Modeling of Lightning Activity in Thunderstorms for use in Short Term Forecasting of Flash Floods) will be illustrated.