



Spatial and temporal correlation between sprites and their parent lightning flashes for a storm case during HyMeX campaign

Serge Soula (1), Eric Defer (2), Martin Fullekrug (3), Thomas Farges (4), Oscar van der Velde (5), Sylvain Coquillat (1), Jean-Pierre Pinty (1), Jean-Michel Martin (1), William Rison (6), Paul Krehbiel (6), Ronald Thomas (6), Olivier Bousquet (7), Christian Vergeiner (8), and Stéphane Pedeboy (9)

(1) Laboratoire d'Aérodynamique, OMP, Toulouse Cedex, France (serge.soula@aero.obs-mip.fr, 33 561332790), (2) LERMA, Observatoire de Paris, Paris, France, (3) University of Bath, Bath, United Kingdom, (4) CEA, DAM, DIF, 91297 Arpajon Cedex, France, (5) Department of Electrical Engineering, Technical University of Catalonia, Terrassa, Spain, (6) NMT, Socorro, NM, USA, (7) CNRM, Météo France, Toulouse, France, (8) TU Graz, Graz, Austria, (9) Météorage, Pau, France

During the SOP1 (Special Observation Period) of the HyMeX (Hydrology cycle in the Mediterranean Experiment) experiment, optical observations of sprite events were performed thanks to low light video cameras. On October 22nd – 23rd night, a storm developed in southeastern France and produced a moderate lightning activity during about 4 hours with a maximum cloud to ground (CG) flash rate of about 2 per minute. 12 sprite events were observed over this storm when it was located in the area of a Lightning Mapping Array. Each was associated with a positive CG stroke detected by the operational lightning detection networks during the last third of the storm activity, when the CG flash rate dramatically decreased. These positive strokes were detected below the stratiform region of the storm, ahead of the convective system. Some of the sprite events were seen by two cameras and could be triangulated for a precise location. Observations of broadband ELF/VLF activity have been performed during this storm activity. They reveal a sustained VLF activity for cases of sprites with long duration and several elements shifted in time. The 3D location of the VHF sources allows describing leader paths and their correlation with the timing and the location of sprite elements.