



Electromagnetic signatures of winter thunderstorms observed in the West Mediterranean

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During winter months intense low-pressure systems developing over the warm Gulf Stream transport unstable arctic air masses into Western Europe. These cold air masses often stagnate in the area of the Mediterranean Sea, forming Genoa lows with a high number of winter thunderstorms. Winter thunderstorms are characterized by a higher portion of positive lightning strokes and also by a production of very energetic lightning strokes.

We present an analysis of broadband measurements of electromagnetic signatures of winter thunderstorms recorded in the West Mediterranean region from November 2014 to February 2015. The frequency band of our instrumentation (5 kHz-90 MHz) allows us to investigate fine details of recorded waveforms including the properties of preliminary breakdown pulses. Our dataset consists of more than 700 lightning flashes and was completed with information about locations and peak currents of CG strokes and IC discharges detected by MÉTÉORAGE, the French national VLF/LF lightning locating system. We compare our results with properties of winter thunderstorms observed in Japan and in the USA.