

TECHNICAL NOTE

December 2015

Performance analysis of the Météorage network in 2015

Storm-chasing campaign

The video data and electric field recording campaign took place from 16 July to 6 October 2015. A total of 206 observations were recorded across France during 13 storm-chasing missions carried out by Temps d'Orages.

The map below indicates the places where the data was collected.



The table below shows the monthly distribution of the missions, the recordings taken and the corresponding performance indicators. Some videos can't be used for the correlation with Météorage data because it isn't possible to clearly visualise the return strokes. This happens when the camera is triggered at the wrong moment

owing to strikes out of shot whose glow triggers the camera, or intracloud lightning.

Year	July	August	September	October	Total
Number of missions	5	6	1	1	13
Number of videos	57	101	28	20	206
No. of videos/missions	11	17	28	20	16
Number of useful videos	43	53	16	7	119
Useful video:mission ratio	75%	32%	57%	35%	57%

The late start to the stormy season in July means that it wasn't possible to collect much video data despite it being a year with a high incidence of lightning strikes. Out of the 206 videos collected, only 119 could be used for correlation with Météorage data. Incidentally, the direct cost of acquiring a useful video by Météorage (excluding amortisation of the equipment) is just under €50.

With so few observations, 2015 was the least prolific year in terms of useful video data.

Data analysis

By correlating the video data with Météorage data, it is possible to calculate the performance indicators such as detection efficiency (number of flashes or return strokes detected by the network compared with the number of video observations) and the relative positional accuracy (distance between two subsequent return strokes that have used the same ionised channel and that consequently present the same strike point on the ground).

The table below presents the results for 2015 as well as those from previous years calculated according to the video data collected by Temps d'Orage:

Year	No. flashes	DE flash (in %)	No. strokes	DE strokes (in %)	LA (in m)
2015	119	97%	245	94%	120m (78)
2014	264	96%	582	87%	280m (127)
2013	151	95%	520	82%	120m (144)

Discussion

We have observed a very clear improvement in stroke detection efficiency (94%), with an increase of 7 points compared with 2014, which had already experienced an increase compared with the previous year. This improvement also benefits flash detection efficiency (97%), which has increased by 1 point. One of the plausible explanations behind this result is because Météorage's sensors were upgraded to LS7002 and the increase in sensor gain at the end of 2014. Although it isn't possible to distinguish the deciding factor, it is these factors which led to an increase in the sensitivity of the sensors and their ability to detect the weakest signals.

The median positional accuracy (120 m) also shows an improvement compared with 2014, matching its 2013 performance. The fall in the median positional accuracy last year was due to the wrong configuration of the TLP, which was corrected in March 2015. For information, the size of the sample used to calculate the value of the median accuracy is indicated between brackets in the column next to the result.