



The ILAN sprite campaigns in Israel: results from 7 years of observations

Yoav Yair (1), Lior Rubanenko (2), Dor Katzenelson (2), Neta Rosenthal (2), Keren Mezuman (2), and Colin Price (2)

(1) The Open University, Natural and Life Sciences, Ra'anana, Israel (yoavya@openu.ac.il, 972 9 7780661), (2) Tel-Aviv University, Department of Geophysical, Atmospheric and Planetary Sciences, Tel-Aviv, Israel 69978

The ILAN (Imaging of Lightning And Nocturnal flashes, <http://ilanteam.com/>) campaigns have been conducted since 2004 from Israel, observing winter thunderstorms in the eastern Mediterranean. We searched for transient luminous events using the standard commercial CCD cameras (Watec N100, 902H2 Ultimate) and the UFO-capture software for event detection, commonly used by other TLE- research groups in Europe and Japan. Winter thunderstorms mostly occur in conjunction with the passage of cold fronts in Cyprus lows, and thus TLEs are best observed when the storms are 200-300 km west of the Israeli coastline, above the Mediterranean Sea.

We present statistical analysis of 505 sprites observed in 7 winter campaigns from 2006/7-2012/13. Results show a clear peak in the frequency of sprite detections, with maximum values (above 40% of events) between 00:30-02:50 LST (Local Standard Time, UT+2). This distribution is very different from that of lightning in the region, which peaks ~ 05:00 LST over the sea (Altartatz et al., 2001), hinting at the different temporal behavior of +CG flashes, known to be the major producers of sprites.

The morphological distribution of 339 sprites is dominated by column sprites (49.3%) with angels (33.0%) and carrots (25.7%) being less frequent. This is similar to reports of winter sprites over the Sea of Japan (Matsudo et al., 2007). Other shapes (trees, wishbones, etc.; Bór, 2013) appear quite rarely. Single element events constitute 16.8% of observations, with 83.2% containing 2 elements or more. Clusters of homogenous types are slightly more frequent than mixed ones (55%). In some rare cases we observed 12-23 elements in a single sprite. The number of elements and the temporal distribution of different sprite types will be presented and compared with the properties of the parent thunderstorms.

Altartatz, O., Levin Z. and Y. Yair, 2001: Winter thunderstorms in Israel – a study with lightning location systems and weather radar. *Month. Weath. Rev.*, 129, 5, 1259-1266.

Bór, J., 2013: Optically perceptible characteristics of sprites observed in Central Europe in 2007–2009. *Jour. Atmos. Sol. Terr. Phys.*, 92, 151-177 doi.org/10.1016/j.jastp.2012.10.008.

Matsudo Y., Suzuki T., Hayakawa M., Yamashita K., Ando Y., Michimoto K., Korepano V., 2007: Characteristics of Japanese winter sprites and their parent lightning as estimated by VHF lightning and ELF transients *Jour. Atmos. Solar Terr. Phys.*, 69, 12, 1431–1446.