

Characteristics of Transient Luminous Events in Eastern Mediterranean Thunderstorms: Results from a 7-Year Survey

Yoav Yair^{1*}, Colin Price²

¹The Open University of Israel, ²Tel-Aviv University

Lightning activity in the Eastern Mediterranean and the vicinity of Israel is prevalent in winter, mostly between November and March, in conjunction with the passage of cold Cyprus Lows over the relatively warm water of the Mediterranean Sea. Thunderstorm cells are 6-8 km in height and are often found in cold-fronts and within the ensuing cloud streets, and are sometimes accompanied by Transient Luminous Events. The ILAN campaigns (Imaging of Lightning and Nocturnal Flashes) have been conducted continuously since 2004, monitoring the properties of the TLEs associated with thunderstorms in Israel and its vicinity. The optical observations have been conducted from the Tel-Aviv University campus and from the Wise Astronomical Observatory at Mitzpe Ramon in the Negev desert, at first alternating between sites and later simultaneously. The optical campaigns were accompanied by ELF and VLF data and lightning location systems. We will review the statistical data obtained in 7 winter campaigns (2004/5-2012/13), describe the properties of sprites and of other TLEs, and analyze their dependence on the properties of their parent flashes. A comparison to similar winter storms in Japan and Europe reveals similarities and differences in the properties of winter TLEs.

Keywords: Winter thunderstorms, Lightning, Transient Luminous Events, Sprites, Optical observations