



Sprite Climatology in the Eastern Mediterranean Region

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We present statistical analysis of 436 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 (< 40% of events) between 00:30-02:15 LST (22:30-00:15 UT; $LST=UT+2$). The detection times of sprites are well-correlated with a relative increase in the fraction of +CG strokes, which exhibit maxima between 00:00-02:00 LST. The morphological distribution of 339 sprites, that we were able to clearly identify, 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 and summer ones in central Europe. Other shapes such as trees, wishbones, etc. appear quite rarely. Single element events constitute 16.5% of observations, with 83.5% containing 2 elements or more. Clusters of homogeneous types are slightly more frequent than mixed ones (55%). Our observations suggest winter East Mediterranean thunderstorms to have a vertical structure that is an intermediate type between high tropical convective systems and the lower cloud-top cells in winter thunderstorms over the Sea of Japan. The climatology shows that the Eastern Mediterranean is a major sprite producer during Northern Hemisphere winter, and thus the existing and future optical observation infrastructure in Israel offers ground-based coverage for upcoming space missions that aim to map global sprite activity.