



The Statistic Results of the ISUAL Lightning Survey

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The ISUAL (Imager for Sprites and Upper Atmospheric Lightning) onboard FORMOSAT-2 is the first science payload dedicated to the study of the lightning-induced transient luminous events (TLEs). Transient events, including TLEs and lightning, were recorded by the intensified imager, spectrophotometer (SP), and array photometer (AP) simultaneously while their light variation observed by SP exceeds a programmed threshold. Therefore, ISUAL surveys not only TLEs but also lightning globally with a good spatial, temporal and spectral resolution. In the past 12 years (2004-2016), approximately 300,000 transient events were registered, and only 42,000 are classified as TLEs. Since the main mission objective is to explore the distribution and characteristics of TLEs, the remaining transient events, mainly lightning, can act as a long-term global lightning survey. These huge amount of events cannot be processed manually as TLEs do, therefore, a data pipeline is developed to scan lightning patterns and to derive their geolocation with an efficient algorithm. The 12-year statistic results including occurrence rate, global distribution, seasonal variation, and the comparison with the LIS/OTD survey are presented in this report.