

A new approach to the coupled atmosphere-ionosphere system: global monitoring of lightning-induced transient luminous events

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Recent discoveries of lightning-induced, high-altitude glows, known as transient luminous events (TLEs: sprites, elves, blue jets, gigantic jets, etc.), have provided dramatic new evidence of electrical discharges in the middle and upper atmosphere. Ground-based monitoring of global TLE activity is being carried out at three observation sites deployed globally: Syowa station (69.0S, 39.6E) in the Antarctic, ESRANGE (67.9N, 21.1E) in the Arctic, and Onagawa observatory (38.4N, 141.5E) in Japan. In addition, spacecraft monitoring is being carried out using the ISUAL instrument on board the ROCSAT-2 satellite which was launched in May 2004. Using these monitoring data, we are investigating the roles of TLEs in the coupled atmosphere-ionosphere-magnetosphere system. Base on these investigations, we will discuss about links between solar activity and global lightning/TLE activity and contributions to space weather and climate studies.