

High resolution total lightning climatology from 16-years of TRMM Lightning Imaging Sensor observations

Intended for Lightning and Climate

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Launched into space as a component of NASA's Tropical Rainfall Measuring Mission (TRMM) satellite, in November 1997, the Lightning Imaging Sensor (LIS) is still operating, taking measurements of total (i.e., intracloud and cloud-to-ground) lightning from space in a low-earth orbit (35° inclination). We present a revised and current total lightning climatology over the tropics, based on high (0.50°) and very high (0.25° and 0.10°) composite climatological maps. The position of lightning maximums have a dependency on the scale of analysis (resolution). We give an updated lightning maximum ranking by continent, as well as a brief study on the total lightning hotspot of the tropics: Lake Maracaibo, Venezuela. Also, the total lightning trends observed by LIS from 1998 to 2001 (TRMM pre-boost) and 2001 to 2013 (TRMM post-boost) showed no systematic trends in the median to lower-end of the distributions, but most locations in the tropics show a decrease in the highest instantaneous total lightning flash rates (higher-end of the orbit by orbit flash rate distributions).