



## **A climatology of cloud-to-ground lightning for the period 2002-2013 in Poland based on PERUN lightning detection network**

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Research presents an overview on thunderstorm occurrence in Poland. It focuses on the climatology of cloud-to-ground (CG) lightning based on 12-year long PERUN lightning detection network database. To present various lightning characteristics in the way how they would be perceived by human, we go through the lightning location data using radius of 17.5 km within the 1x1 km bins. Total of 4952203 CG flashes from period 2002-2013 are used to analyze spatial, annual, monthly and diurnal distributions of lightning count, polarity, peak current and thunderstorm days. Each year, an average of 151 days with thunderstorm occur anywhere in Poland. Within grid point, an annual number of days with thunderstorm increases from northwest to southeast with lowest values along the Baltic Sea coast (15-20 days) and highest in Carpathian Mountains (30-35 days). Mean CG flash density varies from 0.2 to 2.6 km<sup>-2</sup> yr<sup>-1</sup> reaching the lowest values along Baltic Sea coast and highest in the SW-NE belt from Kraków-Częstochowa Upland to Masurian Lake District. Monthly variation show well-defined thunderstorm season extending from May to August with July as a peak month. The vast majority of flashes were detected during daytime (85%) with peak at 1400 UTC and minimum at 0700 UTC. Thunderstorm severity measured by average annual number of CG lightning per thunderstorm day increased from 2002-2007 to 2008-2013 by 14.8%. In the same years, an increase in the percentage of CG flashes occurring during nighttime from 12 to 17% was also observed.