Sessions 2a, 2p

Lightning Occurrence Characteristics

Moderator's Report

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A total of 15 papers have been accepted for session 2 „Lightning occurrence characteristics"- 7 papers have been assigned for oral presentation and 8 papers for poster presentation.

Papers selected for oral presentation are supposed to provide a good overview of the different topics within the subject.

Papers for oral presentation

In **paper 2.1** analytical expressions are developed for the calculation of the nearest neighbour distribution of randomly occurring lightning events - an interesting approach to quantify the risk of getting struck by lightning.

Paper 2.2 describes setup and some results of a VHF Broadband interferometer lightning monitoring system. This type of system provides information about the three dimensional structure of the lightning discharge and similar to data from the other operational 3D-systems (e.g. LDAR) new insight in the physical processes within the thundercloud during a lightning flash are expected.

The problem of peak current estimates from measured electromagnetic fields is addressed in **paper 2.3**. Based on model calculations it is shown, that the peak of lightning radiated fields is significantly increased by strike objects when the current rise time is smaller than 2h/c, h being the height of the object. This topic is of special interest in terms of application of peak current estimates from lightning location systems.

Paper 2.4 addresses the issue of automatic lightning warning based on LLS data. Various methods for detecting nearby thunderstorms are compared in terms of probability of warning, warning lead time and false alarm rate.

Regional observations of extremely high ground flash density values in Columbia (up to 49 flashes/km^2.year) are reported and analyzed in **paper 2.5**. For this region also multiplicity and polarity distributions different from other studies around the world are presented.

In **paper 2.6** some effects of network upgrade and configuration changes on the overall performance of LLS are demonstrated. The median peak current of located flashes decreases when the network performance is improved and when as a result of this improvement the LLS is able to detect additional strokes of smaller peak amplitudes.

Lightning activity in Iceland is analyzed in **paper 2.7**, a region where most of the thunderstorm activity occurs during winter time which is quite different from most of the other regions in the world.

Poster presentations

Lightning activity observations with SAFIR systems are presented in **paper 2p.1** and **paper 2p.7**. In **paper 2p.7** a comparison of SAFIR data with data from a different location system based on LPATS and IMPACT sensors is presented.

Data from a recently installed new lightning detection network in southern Germany are analyzed and compared with data from the BLIDS – ALDIS system in **paper 2p.5**.

In **paper 2p.2** an approach is presented to estimate the charge transfer of individual flashes. Flash charge is a lightning parameter not provided by location systems but of great interest for lightning protection applications.

Usage of wavelet transformation for classification of electromagnetic field data and CG/CC discrimination is presented in **paper 2p.3**.

Possibility of thunderstorm prediction in Iceland is evaluated in **paper 2p.4**. Several thunderstorm indices were analyzed for the specific climatology of this northern country.

Ground flash density for the Tomsk region is estimated from OTD satellite lightning data in **paper 2p.6**. To determine the CG/CC ratio LPATS/IMPACT network data in Southern Germany were used as a reference.

Characteristics of thunderstorm activity in Belgium are evaluated in **paper 2p.8**. A so called Lightning Activity Index (LAI) derived from SAFIR system lightning data is analyzed in different time scales and allows to describe the nature of storms.