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## Performance validation of ground strike point algorithms

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### Abstract

An important input parameter in lightning protection/risk studies is the lightning flash density. Lightning Location Systems (LLS) do provide flash data, with a single location allocated to each flash. However, cloud-to-ground (CG) flashes are known to exhibit one or more ground strike points (GSP). Therefore, determining the different GSP within a single flash is of great importance to correctly investigate the potential risk of lightning damage. In this study several GSP identification algorithms are tested by usage of high-speed video measurements in order to validate the ability to reproduce the observed GSP with LLS data. The ground truth data are taken in Austria (2012, 2015), Brazil (2008), France (2013-2016), South-Africa (2017-2018), Spain (2017-2018) and USA (2015), and are correlated to operational LLS data in order to extract the location, peak current estimate and other parameters serving as input for the GSP algorithms. As such, the validation of the GSP algorithms is based on ~850 flashes comprised out of ~2500 strokes. The performance of the GSP algorithms to classify correctly new ground contacts (NGC) or strokes following previously existing channels (PEC) will be analyzed and compared to each other to identify the strengths and weaknesses of each algorithm.

### Topic Areas

Lightning Physics, Characteristics and Measurements

### Submission Format

No preference