Lightning Parameters for Engineering Applications

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From the information available in the literature at the present time, there is no evidence of a dependence of negative cloud-to-ground lightning parameters on geographical location, except maybe for first and subsequent return-stroke peak currents, for which relatively insignificant (less than 50%), from the engineering point of view, variations may exist. It is important to note, however, that it cannot be ruled out that the observed differences in current measurements are due to reasons other than «geographical location», with the limited sample size for some observations being of particular concern. Similarly, no reliable information on seasonal dependence is available. In summary, at the present time, the available information is not sufficient to confirm or refute a hypothesis on dependence of negative CG lightning parameters on geographical location or season. On the other hand, some local conditions may exist (for example, winter storms in Japan) that give rise to more frequent occurrence of unusual types of lightning, primarily of upward type, whose parameters may differ significantly from those of "ordinary" lightning. Further studies are necessary to clarify those conditions and their possible dependence on geographical location.

Lightning parameters needed for specific engineering applications are summarized. The emphasis is placed on the parameters that have an influence in the electric power engineering calculations, although lightning parameters needed for designing lightning protection of ordinary ground-based structures are also discussed.