

Lightning Electromagnetic Environment

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Lightning current and electromagnetic field parameters are of prime importance in designing lightning protection devices and in many other physics and engineering applications. Several reviews on lightning currents in both natural and artificial lightning are published, however a review on lightning generated electromagnetic fields is not available in either local or international literature. This study provides a concise review on up-to-date information of the lightning generated electromagnetic fields measured at various distances. The discussion is mainly confined into the lightning return stroke fields. The fields due to both negative and positive return strokes are treated.

Another important aspect of lightning, discussed in this work, is the repetitive nature of the main discharge event, the return stroke. This includes the number of strokes per flash, the fraction of strokes with amplitudes greater than that of the first stroke, the inter-stroke interval etc. These parameters are significant in the withstanding ability and the long-term durability of the lightning protection devices.