

Analytical field expressions due to inclined lightning channel

ABSTRACT

In order to have a fast determination of electromagnetic fields peaks associated with inclined lightning channel, the analytical electromagnetic field expressions were proposed, assuming a pulse shaped return stroke current at channel base and by considering the channel angle and the observation point angle effects on the electromagnetic fields. Also, the return stroke velocity effects on the peaks of electromagnetic fields were processed. The results were compared with the perpendicular lightning channel case. The proposed fields expressions are very useful in determining the peak values of electromagnetic fields, since they are considered as critical parameters in estimation of lightning induced voltage peak on the power line.

Keyword: Electromagnetic fields; Lightning; Inclined channel