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Estimation of Lightning Currents from Measurements Performed on Elevated Objects

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Abstract: Currents measured on an elevated object are affected by the differences among the impedances or the lightning channel, the strike object and the grounding system and are said to be "contaminated" by the reflections that occur at the top and base of the structure. The main goal of this paper is to evaluate, through the model proposed by Rachidi et al, the sensitivity of the current wave "decontamination" process with respect to the lightning channel characteristics and to parameters such as the height and surge impedance of the strike object and the grounding impedance. In order to evaluate the influence of the presence of the strike object on the stroke current, the "contaminated" and "undisturbed" currents are compared, in different situations, with the "reference" current, that is, the current that would flow through the lightning channel in the absence of the elevated structure.

Index Terms- elevated objects, electromagnetic transients, lightning current, travelling waves.

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