

## Flashover Detection Algorithm Based on Mother Function

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**Abstract :** Electric Power supply is a crucial topic for economic and social development. Power outages statistics show that discharges atmospherics are imperative phenomena to produce those outages. In this context, it is necessary to correctly detect when overhead line insulators are faulted. In this paper, an algorithm to detect if a lightning stroke generates or not permanent fault on insulator strings is proposed. On top of that, lightning stroke simulations developed by using the Alternative Transients Program, are used. Based on these insights, a novel approach is designed that depends on mother functions analysis corresponding to the given variance-covariance matrix. Signals registered at the insulator string are projected on corresponding axes by the means of Principal Component Analysis. By exploiting these new axes, it is possible to determine a flashover characteristic zone useful to a good insulation design. The proposed methodology for flashover detection extends the existing approaches for the analysis and study of lightning performance on transmission lines.

**Keywords :** mother function, outages, lightning, sensitivity analysis

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