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Neural Network Application for predicting composite Insulator Flashover voltage under Contaminated conditions

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Abstract – Increased focus on contaminated insulators at high voltage transmission lines has emerged due to their growing significance. This pollution may cause flashover voltage, potentially resulting in service interruptions and negatively impacting the power system's dependability. The occurrence of flashovers in power transmission line insulators poses a significant risk to the efficient functioning of power systems. This study aims to address the issue of predicting flashovers in composite insulators employed in power transmission lines. It achieves this by utilizing a neural network technique. The present research examines the utilization of Artificial Neural Networks (ANN) to forecast the flashover characteristics of composite insulators influenced by weather and environmental factors. The training data for ANN was sourced from tests conducted in a climate chamber under high voltage stress. The predicted parameters in this research include, flashover voltage, and surface resistance. The proposed ANN model offers a valuable tool for accurately predicting the flashover parameters of composite insulators affected by extreme humidity, and pollution levels. These findings will also contribute to a better comprehension of the flashover process in outdoor composite insulators.

Keywords – *Composite Insulators, High-voltage, Pollution, Flashover, Artificial neural networks.*
