SOIL RESISTIVITY BEHAVIOR UNDER HIGH CURRENT DENSITY VALUES USING THE ENERGY BALANCE METHOD

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This paper aims at contributing to the study of grounding systems behavior due to direct lightning currents striking rural distribution lines located in high flash density areas. The high current density, from direct flashes, causes soil ionization phenomenon in grounding systems. In order to investigate the ionization phenomenon under various grounding conditions, impulse tests were performed on three types of soils with different resistivities, considering different humidity conditions. Using the Energy Balance method, values for the critical electric field and thermal soil constant were determined. The obtained values for the critical electric field are very close to those found in the literature and the soil thermal constant showed a strong correlation with the critical electric field.