

Finite Element Computation Of Electric Field And Charge Density Ofa Pulsed Energized Electrostatic Precipitator

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Summary

This paper numerically analyzes the governing equations in pulsed energized wire-duct electrostatic precipitators (WDEP). The electric field along its spatial distribution and the voltage-current characteristics are evaluated in the presence of dust. The finite element method (FEM) and a modified method of characteristics are used to solve the time-dependent Poisson's equation and to satisfy the current continuity condition, respectively. The two methods are repeated iteratively to obtain a self-consistent solution of the describing equations. The effect of pulse rate variation on the computed results is also investigated. Comparing the computed results with previously obtained experimental and calculated values tests the effectiveness of this approach. The agreement with experimental results is found to be satisfactory

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