

# Numerical Evaluation of Electric Field and Dark Current of Resistive Plate Chamber

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It is important to understand the calculation of electric field and current in RPC in order to envisage the working of the device. This is useful in optimizing its design and operation for specific applications. A method of calculating the 3D electric field using the law of full current conservation showed that the voltage drop across the gas gap is same as that applied across the resistive electrodes and reproduced the ohmic region of the I-V characteristics. The electrical equivalent circuit of RPC modeled in other works simulated the non-ohmic region, but did not calculate field configuration in the gas gap. We have performed a calculation of the electric field and current of RPC from the first principle using finite element method. The results have been compared to the analytic approach to establish the model. It has been then used to study the effect of the electrode and spacer materials on field configuration and dark current and produce the non-ohmic character of the I-V graph.

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No, this is an entirely new submission.

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