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2P80 - Insulator Technologies to Achieve Maximum Electric Field Holdoff

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In large machines, such as accelerators and high power microwave systems, it is common to implement pulsed power technology. Pulsed power attempts to deliver large amounts of power in a short amount of time. This is done by generating high voltage and delivering that energy to the desired load quickly through switches. To ensure that the energy is delivered to the desired load it is necessary to use insulators to separate high voltage from ground. The insulators function is crucial in the success or failure of the system and because of this, much research has been done in the materials, geometries, and sizes of insulators. A common mean of failure for these insulators is surface flashover. Surface flashover occurs when the electric field becomes strong enough to accelerate electrons along the surface of the insulator to a point where an arc is created between high voltage and ground. The machine is therefore limited to the amount of voltage it can holdoff and the amount of power it can deliver. By making modifications to the insulator, improvements in electric field holdoff has been documented. This paper attempts to analyze the different methods used to increase the electric field holdoff to improve the function of the system.

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