

# **Magnetic Insulation to Improve Voltage Holding in Accelerators For Fusion Applications**

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Voltage holding in high voltage electrostatic accelerators is a longstanding problem which is usually one of the primary constraints limiting the practically obtainable performance of most accelerator systems. In this talk we propose an idea for improving the voltage holding in electrostatic accelerators by suppressing breakdowns between successive stages of an accelerator. The idea consists of flowing electric currents along the accelerator electrodes to produce magnetic fields which envelope each electrode and its support structure, so as to prevent very low energy electrons from leaving the surfaces of electrodes and subsequently picking up energy from the electric field. In order to be useful in some applications, this magnetic insulation would only need to produce modest gains in voltage holding capability, and its utility can be easily tested experimentally as we describe. We discuss some of the implications of using this technique in an accelerator of the sort used for negative ion neutral beams being developed for magnetically-confined fusion applications.

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