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## **A POSSIBLE APPLICATION OF NEW DISCOVERIES IN VACUUM HIGH-VOLTAGE INSULATION**

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An investigation of vacuum high-voltage insulation processes has been carried out at the Tandem Accelerator Superconducting Cyclotron (TASCC) facility with the goal of improved operation of the cyclotron electrostatic deflector. This research program has produced an improved understanding of the underlying processes of electrical breakdown in vacuum. Electric fields as high as 90 MV/m at a 1-mm gap and 50 MV/m at a 4-mm gap have been reached with no measurable field emission. The control of field emission is key to the realization of an electrostatic accelerator designed for vacuum insulation instead of gas. This paper will present an approach to a new accelerator design inspired by our research program.

## ***IN-SITU* AMS DETERMINATION OF Re-Os ISOCHRON IN IIA IRON METEORITES**

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Using two electrostatic plate deflectors, we have developed an isotope switching system for the IsoTrace AMS system. It was applied to the *in-situ* determination of Re-Os isochrons for the Ni-Fe phases of a set of iron meteorites with emphasis on group IIA. The method requires no chemical sample treatment and permits analysis of the Re-Os systematics of materials at sub-mm scales. The fitted isochron of IIA irons corresponds to an age of  $4.70 \pm 0.31$  Ga, consistent with the latest reported IIA ages of  $4.584 \pm 0.043$  Ga (Morgan *et al.* 1995) and  $4.61 \pm 0.01$  Ga (Shen, Papanastassiou and Wasserburg 1995), obtained by conventional whole-rock methods. The detection limits of Re and Os are estimated to be 54 ppb and 0.5 ppb, respectively. It is shown that *in-situ* AMS has the capability to obtain an internal Re-Os isochron in iron meteorites. It also provides a convenient and sensitive tool to study Re-Os systematics in broad geological applications.

## **REFERENCES**

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