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Measurements of the Backstreaming Proton IONS in the Self-Magnetic Pinch (SMP) Diode Utilizing Copper Activation Technique MICHAEL MAZARAKIS, MICHAEL CUNEO, SEAN FOURNIER, MARK JOHN-STON, MARK KIEFER, JOSHUA LECKBEE, SEAN SIMPSON, TIMOTHY RENK, TIMOTHY WEBB, Sandia National Laboratories, NICHELLE BENNETT, National Security Technologies, LLC — The results presented here were obtained with an SMP diode mounted at the front high voltage end of the 8-10-MV RITS Self-Magnetically Insulated Transmission Line (MITL) voltage adder. Our experiments had two objectives: first, to measure the contribution of the back-streaming proton currents emitted from the anode target, and second, to evaluate the energy of those ions and hence the actual Anode-Cathode (A-K) gap voltage. The accelerating voltage quoted in the literature is estimated utilizing para-potential flow theories. Thus, it is interesting to have another independent measurement of the A-K voltage. We have measured the back-streaming protons emitted from the anode and propagating through a hollow cathode tip for various diode configurations and different techniques of target cleaning treatment, namely, heating at very high temperatures with DC and pulsed current, with RF plasma cleaning, and with both plasma cleaning and heating. We have also evaluated the A-K gap voltage by energy filtering techniques. * Sandia is operated by Sandia Corporation, a subsidiary of Lockheed Martin Company, for the US DOE NNSA under Contract No. DE-AC04-94AL85000.

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