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Anode heating/cleaning and its effects on diode impedance in Self-Magnetic Pinch (SMP) Experiments* TIMOTHY RENK, SEAN SIMPSON, Sandia National Laboratories, JACOB ZIER, BRUCE WEBER, Naval Research Laboratory — The SMP diode is fielded on both the RITS-6 (3.5-8.5 MV) and Mercury (5.5 MV) accelerators, located at Sandia and the Naval Research Laboratory, respectively. This diode utilizes a hollowed metal cathode to produce focused electron beams (<3 mm diameter) onto a high-Z converter for flash x-ray applications. We observe on some shots unexplained impedance collapse beyond what may be attributed to normal A-K gap closure. This could be caused by gas evolution off the as-provided hardware making up the anode and cathode. The goal of heating the anode is to remove gases trapped within the bulk of the Ta anode, and so reduce the volume of evolving gases near the A-K gap. Two heating techniques have been investigated, a short-pulse (∼1 sec) resulting in high Ta temperature (∼3000 °C), and a longer (∼100 sec) heating of the Ta to lower peak temperature (∼1000 °C). Initial experiments indicate a modest improvement to diode performance. Additional experiments are ongoing, and latest results will be reported.

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