

Abstract Submitted
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Bias Current Control Via Pulse Width Modulation on the Rotating Wall Machine SAM STAMBLER, W. BERGERSON, C.B. FOREST, R. KENDRICK, S. OLIVA, UW-Madison — Dynamic current profile control is achieved in the Rotating Wall Machine (RWM) by a recently developed pulse width modulation (PWM) scheme that individually controls the current through as many as seven different plasma guns with up to 1KA each. The system is based around a simple PWM scheme where the current through the plasma is monitored, compared to a reference waveform and the bias voltage is switched on or off to compensate. Inductors provide finite dI/dt allowing the current to oscillate about the desired value in a saw tooth manner. Improved performance is achieved by using a high voltage source to quickly achieve the desired starting current and two lower voltages to then switch between to give smaller dI/dt . This high level of control is required to effectively study the detailed nature of the plasma's instability as well as the effects of complex, time dependent current profiles. The PWM system's high flexibility will allow it to easily adapt to the many changes in plasma characteristics that will occur over the full course of the RWM experiment. Design and experimental data will be discussed. Work supported by the DoE.

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