

PROGRESS ON PULSE LENGTHENING OF A RELATIVISTIC BACKWARD WAVE OSCILLATOR

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Laser interferometry has been used to diagnose plasma formation and evolution in the slow wave structure (SWS) of a relativistic backward wave oscillator (BWO) during the course of microwave generation [1]. The results indicated that plasma from the cutoff neck inlet contributed to the termination of the high power microwave pulse. In an effort to mitigate this pulse shortening effect we have replaced the cutoff neck with a Bragg reflector [2]. As part of these studies we have observed the cross-excitation instability [3] because of the particularly shallow-ripple SWS used. We will present results from recent experiments performed with the long pulse relativistic BWO, including the implementation of a hybrid-hard tube BWO.

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- [3] C. Grabowski, E. Schamiloglu, C.T. Abdallah, and F. Hegeler, *Physics of Plasma*, vol. 5, p. 3490 (1998).

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