

Abstract Submitted  
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**Testing of a diamond Brewster angle waveguide window at DIID<sup>1</sup>** A. LEVINNESS, The University of Alabama, J. LOHR, J. ANDERSON, M. CENGHER, Y.A. GORELOV, C. MOELLER, D. PONCE, A. TORREZAN, General Atomics, L. IVES, M. READ, Calabazas Creek Research — To avoid reflections, gyrotrons operate with output windows having thickness of  $n\lambda/2$ , where  $\lambda$  is the wavelength of the rf wave in the window and  $n$  is an integer. This limits the gyrotron output frequency to discrete values. Transmission of rf through a window at the Brewster angle,  $\sim 67.2^\circ$  in diamond, is insensitive to wavelength for rf waves polarized with the electric field out of the window plane. Use of a Brewster angle window therefore allows operation of a gyrotron at a near-continuum of frequencies, an advantage despite the cost of such a large window. Tests of a Brewster angle window were performed for waveguide with 31.75 mm diameter, designed for a frequency of 110 GHz, but with wide bandwidth. The tests included measurement of the rf loss in the window at relatively high power and the effect of the window on mode structure of an incident  $HE_{1,1}$  beam. Low power tests were performed for a range of frequencies and polarizations.

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