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14.15 Electrode Coating Deposition System for MCPs used in Time- and Space-Resolved X-ray Imaging and Spectral Diagnostics at the SNL Z Machine

Thursday, 19 April 2018 10:31 (120)

A capability for applying thin film coatings as electrodes in x-ray microchannel plates (MCPs) has been developed at the Nevada National Security Site for the National Nuclear Security Administration community. An electron beam physical vapor deposition system was adapted and modified to implement a well-researched coating process for producing uniform conductive films. Given the exponential gain dependence vs. applied voltage of these MCPs, which are used for time-evolved x-ray detection, spatial uniformity of the gain is completely dependent on the composition and layer thickness of the film materials. This paper describes the coating system and the materials and deposition process for the MCP electrodes. Results are presented from experiments on the Sandia National Laboratories' Z machine that use these coated MCPs in time- and spaceresolved x-ray diagnostics. Flat-field characterization data using a Manson x-ray source are included to show MCP spatial uniformity. This work was done by Mission Support and Test Services, Contractor for the Nevada National Security Site, under Contract DE- NA0003624, and by Sandia National Laboratories under contract DE-NA-0003525. DOE/NV/03624--0026.

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