

Abstract Submitted  
for the DPP08 Meeting of  
The American Physical Society

**Innovative Plasma Imaging Array Concept**<sup>1</sup> BENJAMIN TOBIAS, CALVIN DOMIER, XIANGYU KONG, TIANRAN LIANG, NEVILLE LUHMANN, JR., University of California, Davis, CA 95616, M.J. VAN DE POL, I.G.J. CLASSEN, J. BOOM, R. JASPERS, A.J.H. DONNE, FOM Institute for Plasma Physics Rijnhuizen, Association EURATOM-FOM, The Netherlands, HYEON PARK, Pohang University of Science and Technology, Pohang, Kyungbuk, 790-784, Korea — A new lens/antenna array concept has been developed for millimeter-wave plasma imaging applications with dramatic increases in RF bandwidth and sensitivity. In this arrangement, an array of tightly coupled miniaturized substrate lenses is fabricated such that each antenna has a dedicated substrate lens. The new arrangement exhibits low sidelobe levels over a bandwidth spanning 90 to 140 GHz for use in electron cyclotron emission imaging and microwave imaging reflectometry. An innovative “vertical zoom” control is also supported, which the vertical extent of the imaged plasma can be varied from 20 to 30 cm. The first plasma implementation of the new concept will take place on the TEXTOR tokamak in Fall 2008, with systems for DIII-D and ASDEX to follow in 2009. Experimental details regarding the imaging arrays and the new TEXTOR optical design will be presented.

<sup>1</sup>Work supported by U.S. DoE Grants DE-FG02-99ER54531 and DE-AC02-76CH0307, and by NWO and the Association EURATOM-FOM.

Neville Luhmann  
University of California, Davis

Date submitted: 19 Jul 2008

Electronic form version 1.4