

Abstract Submitted
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Technology Advances in Support of Fusion Plasma Imaging Diagnostics¹ QI JIANG, JIALI LAI, FENGQI HU, MAIJOU LI, YU-TING CHANG, CALVIN DOMIER, NEVILLE LUHMANN, JR., University of California at Davis — Innovative technologies are under investigation in key areas to enhance the performance of microwave and millimeter-wave fusion plasma imaging diagnostics. Novel antenna and mixer configurations are being developed at increasingly higher frequencies, to facilitate the use of electron cyclotron emission imaging (ECEI) on high field (> 2.6 T) plasma devices. Low noise preamplifier-based imaging antenna arrays are being developed to increase the sensitivity and dynamic range of microwave imaging reflectometry (MIR) diagnostics for the localized measurement of turbulent density fluctuations. High power multi-frequency sources, fabricated using advanced CMOS technology, offer the promise of allowing MIR-based diagnostic instruments to image these density fluctuations in 2-D over an extended plasma volume in high performance tokamak plasmas. Details regarding each of these diagnostic development areas will be presented.

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