

Abstract Submitted
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Design of an Eight-Channel Doppler Backscattering System for use on the EAST Tokamak¹ E.J. DOYLE, W.A. PEEBLES, X. NGUYEN, T.L. RHODES, G. WANG, C. WANNBERG, Physics Dept. and PSTI, UCLA, H. LI, A.D. LIU, C. ZHOU, C.X. YU, Dept. of Modern Physics, University of Science and Technology of China — Doppler backscattering (DBS) is a powerful millimeter-wave plasma diagnostic used in tokamaks and other magnetic confinement devices to measure turbulence characteristics [1]. DBS systems measure the laboratory frame propagation velocity of intermediate wavenumber density fluctuations, and also monitor fluctuation amplitudes and frequency spectra, with high spatial resolution (cm level). A DBS system has been designed and is under construction for use on the EAST superconducting tokamak, located in Hefei, China. The new system will provide eight simultaneous fixed-frequency Doppler channels, spanning the V-band (50-75 GHz) frequency range, i.e. the system will provide eight spatially localized measurement locations. The microwave source design for the EAST system is a modified version that used for the eight channel DBS system on the DIII-D tokamak [2]. Details of the modified microwave system design and measured performance characteristics will be presented, along with a design for the microwave interface system for EAST.

[1] M. Hirsch, et al., Plasma Phys. Control. Fusion 43, 1641 (2001).

[2] W.A. Peebles, et al., Rev. Sci. Instrum. 81, 10D901 (2010).

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