

Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

New Digital Control System for the JET Alfvén Eigenmode Active Spectroscopy Diagnostic¹ P.P. WOSKOV, J. STILLERMAN, M. PORKOLAB, PSFC MIT, A. FASOLI, D. TESTA, CRPP-EPFL, R. GALVAO, A. PIRES DOS RESIS, W. PIRES DE SA, L. RUCHKO, IFUSP, P. BLANCHARD, J. FIGUEIREDO, JET CSU, S. DORLING, J. FARTHING, JET CODAS, M. GRAHAM, S. DOWSON, JET JOC, L. YU, S. CONCEZZI, NI, JET EFDA CONTRIBUTORS TEAM² — The state-of-the-art JET Alfvén active spectroscopy diagnostic with eight internal inductive antennas is being upgraded from a single 5 kW tube amplifier to eight parallel, 10 – 1000 kHz, 4 kW solid state class D power switching amplifiers. A new digital control system has been designed with arbitrary constant phase controlled frequency sweeps for traveling mode studies, amplifier gain control through a feedback loop referenced to programmed antenna current profiles, and integration with CODAS for synchronization, triggering, gating, and fault tripping. A combination of National Instruments Real Time LabView software and FPGA circuits is used to achieve the multiple control requirements with better than 1 ms response. System specifications and digital-analog design trade offs for sweep rates, response times, frequency resolution, and voltage levels will be presented.

¹Supported by USDOE, EDFEA, Brazil

²See Appendix of F. Romanelli et al., Proceedings of the 23rd IAEA Fusion Energy Conference 2010, Daejeon, Korea

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Date submitted: 11 Jul 2012

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