

THE DESCRIPTION AND PRELIMINARY RESULTS OF A NEW PHOTO DETECTOR FOR THE DIII-D THOMSON SCATTERING DIAGNOSTIC

T. M. Deterly, B. D. Bray, C.-L. Hsieh, J. A. Kulchar, C. Liu and D. M. Ponce
General Atomics, PO Box 85608, San Diego, California 9186-5608, USA
deterly@fusion.gat.com

A redesign of the Thomson scattering data acquisition system on the DIII-D tokamak is undergoing its trial phase. The redesign was motivated by several factors including the desire to improve the quality of the acquired data. In addition, the previous generation system was based on CAMAC technology, which has become difficult to maintain and is no longer supported. A big part of this improved redesign comes from the use of faster electronics allowing for greatly improved background light subtraction, the main source of noise. The past system utilized LeCroy FERA CAMAC gated integrator modules for integration and digitization. The redesigned system incorporates a more distributed subsystem design philosophy. The new system consists of a number of subsystems, including: photo detectors, digitizers, distribution panels, and timing circuits. The most significant upgrade involved the photo detectors electronics assembly. A key feature was to make the units much more self-contained with respect to the pre-amps, background subtraction, integration and bias circuits. The redesign of the photo detectors and preliminary test results of the trial phase will be presented.

This work was supported by the US Department of Energy under DE-FC02-04ER54698.