

Thomson Scattering Diagnostic Upgrade on DIII-D

D.M. Ponce-Marquez, B.D. Bray, T.M. Deterly, C. Liu, and D. Eldon^a

General Atomics, PO Box 85608, San Diego, California 092186-5608, USA

^aUniversity of California-San Diego, La Jolla, California, USA

david.ponce@gat.com

The first of two upgrade phases for the Thomson diagnostic at DIII-D is complete. Full replacement of detector modules with faster trans-impedance circuitry was done with a corresponding increase in the signal-to-noise ratio by a factor of two. A new complete D-TACQ DT100 system -96 channels, 250 ksps, 16 bit board- was installed for the addition of more spatial channels and capacity of measuring density and temperature over much longer times. This allows for expanding to the pedestal/edge system. The second phase upgrade includes the installation of four one Joule per pulse Nd:YAG lasers at 50 Hz repetition rate. This second phase is to be completed during the DIII-D Long Torus Opening upgrade scheduled for 2010-2011. This paper presents technical aspects of the first completed phase, performance comparison between the original system and the upgraded system, and the plan and technical challenges of the second phase. This work was supported by the US Department of Energy under DE-FC02-04ER54698 and DE-FG02-07ER54917.