Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Upgrades to the Tri Alpha Energy Neutron Detector System [**1**] EUSEBIO GARATE, IAN ALLFREY, TRAVIS VALENTINE, VIJAY PATEL, ARTEM SMIRNOV, SERGEY KOREPANOV, RYAN CLARY, MATTHEW THOMPSON, Tri Alpha Energy, Inc., Rancho Santa Margarita, CA 92688, TRI ALPHA ENERGY TEAM — We are implementing additional scintillator based neutron detectors on the Tri-Alpha Energy C2 system. The current He3 and scintillator detectors are used to estimate the total neutron emission from C2 and the corresponding ion temperature. The new detectors consist of BC-408 scintillator rod directly coupled to a Hamamatsu fine mesh PMT which can be placed in a magnetic field up to 1.5T with little loss in gain. The photocathode of the PMT is gated in order to avoid saturation effects due to high neutron flux during the collision of the compact toroids that form the C2 field reversed configuration. The detectors will be used to observe deuterium beam slowing down times in the C2 target plasma and to correlate neutron detection with C2's neutral particle analyzers, bolometers and fast magnetic probes. We will present a schematic of the detectors and preliminary results.

[1] E. Ruskov, et al., TAE neutron detectors and some physics results, *Bull. Am. Phys. Soc.* **55**, 15, GP9.00103 (2010).

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Date submitted: 16 Jul 2012 Electronic form version 1.4