

Abstract Submitted  
for the DPP15 Meeting of  
The American Physical Society

**A New Neutron Calibration Technique with Fast Scintillators on DIII-D Tokamak**<sup>1</sup> Y.B. ZHU, W.W. HEIDBRINK, Univ of California - Irvine, P.L. TAYLOR, W. CARRIG, GA — Absolute calibrations are necessary for conventional neutron measurements based on proportional counters and fission chambers, at regular intervals. For the DIII-D tokamak, the wide span of fusion rates, approximately between  $1.e9 - 1.e17$  neutrons per second, from pure Ohmic to high power auxiliary heating plasmas requires careful cross-calibrations of a variety of neutron detectors with stepwise and overlapped sensitivities,<sup>2</sup> with an intense isotope neutron source, e.g. californium-252 and real plasmas. Scintillators have been successfully utilized for fast time resolved neutron detection for decades.<sup>3</sup> A new calibration approach with the help of scintillators is shown to be straightforward, simpler and trustworthy while the conventional approach is complicated, time consuming and costly. Details on the calibration setup and results will be presented.

<sup>1</sup>Supported by US DOE SC-G903402 and DE-FC02-04ER54698

<sup>2</sup>W.W. Heidbrink, P.L. Taylor, J.A. Phillips, Rev. Sci. Instrum. 68 (1997) 536.

<sup>3</sup>W.W. Heidbrink, Rev. Sci. Instrum. 57 (1986) 1769.

W.W. Heidbrink  
University of California - Irvine

Date submitted: 03 Dec 2015

Electronic form version 1.4