

Abstract Submitted  
for the DPP17 Meeting of  
The American Physical Society

**Development of the low-field side reflectometer for ITER<sup>1</sup>**

CHRISTOPHER MUSCATELLO, JAMES ANDERSON, ANTHONY GATTUSO, General Atomics, EDWARD DOYLE, WILLIAM PEEBLES, RAYMOND SERAY-DARIAN, GUIDING WANG, UCLA, GERRIT KRAMER, ALI ZOLFAGHARI, PPPL, GENERAL ATOMICS TEAM, UNIVERSITY OF CALIFORNIA LOS ANGELES TEAM, PRINCETON PLASMA PHYSICS LABORATORY TEAM — The Low-Field Side Reflectometer (LFSR) for ITER will provide real-time edge density profiles every 10 ms for feedback control and every 24  $\mu$ s for physics evaluation. The spatial resolution will be better than 5 mm over 30 – 165 GHz, probing the scrape-off layer to the top of the pedestal in H-mode plasmas. An antenna configuration has been selected for measurements covering anticipated plasma elevations. Laboratory validation of diagnostic performance is underway using a LFSR transmission line (TL) mockup. The 40-meter TL includes circular corrugated waveguide, length calibration feature, Gaussian telescope, vacuum windows, containment membranes, and expansion joint. Transceiver modules coupled to the input of the TL provide frequency-modulated (FM) data for evaluation of performance as a monostatic reflectometer. Results from the mockup tests are presented and show that, with some further optimization, the LFSR will meet or exceed the measurement requirements for ITER. An update of the LFSR instrumentation design status is also presented with preliminary test results.

<sup>1</sup>Work supported by PPPL under subcontract S013252-A

Christopher Muscatello  
General Atomics

Date submitted: 30 Jun 2017

Electronic form version 1.4