Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Current status of the ITER MSE diagnostic[1] HOWARD YUH, F. LEVINTON, H. LA FLEUR, E. FOLEY, Nova Photonics Inc., R. FEDER, L. ZAKHAROV, PPPL — The U.S. is providing ITER with a Motional Stark Effect (MSE) diagnostic to provide a measurement to guide reconstructions of the plasma q-profile. The diagnostic design has gone through many iterations, driven primarily by the evolution of the ITER port plug design and the steering of the heating beams. The present two port, three view design viewing both heating beams and the DNB has recently passed a conceptual design review at the IO. The traditional line polarization (MSE-LP) technique employed on many devices around the world faces many challenges in ITER, including strong background light and mirror degradation. To mitigate these effects, a multi-wavelength polarimeter and high resolution spectrometer will be used to subtract polarized background, while retroreflecting polarizers will provide mirror calibration concurrent with MSE-LP measurements. However, without a proven plasma-facing mirror cleaning technique, inherent risks to MSE-LP remain. The high field and high beam energy on ITER offers optimal conditions for a spectroscopic measurement of the electric field using line splitting (MSE-LS), a technique which does not depend on mirror polarization properties. The current design is presented with a roadmap of the R&D needed to address remaining challenges.

[1]This work is supported by DOE contracts S009627-R and S012380-F

Howard Yuh
Nova Photonics Inc.

Date submitted: 12 Jul 2013 Electronic form version 1.4