## Abstract Submitted for the DPP19 Meeting of The American Physical Society

The Wide Emission Spectral (WiSE) Diagnostic on DIII-D<sup>1</sup> ADAM MCLEAN, Lawrence Livermore Natl Lab, TYLER ABRAMS, General Atomics, STEVE ALLEN, LLNL, DAVID AYALA, General Atomics, IGOR BYKOV, UCSD, RON ELLIS, LLNL, JIM KULCHAR, General Atomics, CHAR-LIE LASNIER, LLNL, DAVID PACE, General Atomics, CAMERON SAMUELL, LLNL, AARON SNYDER, General Atomics, KATRINA TEO, University of Washington, DIII-D TEAM — The Wide Spectral Emission (WiSE) diagnostic is a set of 10 absolute intensity calibrated, moderate spectral and temporal resolution spectrometers co-viewing vertically through the plasma being implemented on the DIII-D fusion device for study of neutral, ions, and molecules. Working together with existing extreme ultraviolet (EUV) and vacuum ultraviolet (VUV) diagnostics, this system provides a spectral 'footprint' of a tokamak plasma from 185 nm up through 5000 nm, all along a coincident line-of-sight, spanning the deep ultraviolet (DUV), ultraviolet (UV), visible (VIS), near infrared (NIR), short-wavelength infrared (SWIR) and medium wavelength infrared (MWIR) bands. Light from the plasma passes through a UV-grade sapphire viewport, then is collected with a fused silica-sapphire triplet lens and is transmitted from the machine to up to 10 separate instruments using a multi-pronged fiber bundle. Each spectrometer is capable of 0.5-4.5 kHz operation and is paired with a dedicated compact PC for operation and data acquisition. Details of design choices for the WiSE diagnostic will be presented, with implications for study of plasma parameters, impurity content, line-ratios, radiated power, and transients, along with beneficial implications for boundary code validation in DIII-D.

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Adam McLean Lawrence Livermore Natl Lab

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