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System Design of a Coherence Imaging System to Measure Divertor Ion Temperature on DIII-D[1] CAMERON M. SAMUELL, S.L. ALLEN, W.H. MEYER, LLNL, J. HOWARD, ANU — The interferogram from an imaging polarization interferometer can be used to determine the Doppler shift (phase image) and the Doppler width (contrast image) of a plasma ion species. In the case of a single emission line, the shift is determined at one fixed optical delay, and the width at a second (larger) optical delay. Recent analysis has indicated that it is also possible to recover both the shift and width at the second larger optical delay. However, in the case of a multiplet such as CIII (465 nm), there is an added complication in the width measurement because of the Zeeman splitting of the individual lines; this necessitates taking into account the polarization of the emission. We present progress in the design of a coherence imaging instrument to measure the ion temperature of ion species in the DIII-D divertor and SOL plasma. This uses an interferometer with optical delay optimized for contrast measurements, taking into account polarization effects by either optical switching or polarization mixing.

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