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Fizeau Effect and Measurement Implications for High-Temperature Plasmas W.X. DING, D.L. BROWER, B.H. DENG, University of California, Los Angeles, D. CRAIG, V. MIRNOV, S.C. PRAGER, University of Wisconsin-Madison, A.H. MAHDAVI, General Atomics, San Diego — The Fizeau effect is a phase shift of an electromagnetic wave caused by the motion of a dielectric medium and has been measured in solids, liquids and gases. In MST, measurement of this effect is being pursued for the first time in a plasma. Fizeau interferometry provides a line-integrated measurement of electron current density and ultimately the electron velocity. The estimated phase shift associated with electron motion is estimated to be 2 degrees for typical MST plasmas. This value is well within the phase resolution of the existing FIR laser-based interferometer. The Fizeau interferometer being developed will use counter-propagating beams and measure equilibrium poloidal electron current in MST plasmas. This new diagnostic technique has direct application to burning plasma experiments. Initial results will be presented. *Work is supported by US DOE.*

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