Abstract Submitted
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Polarization of Incoherent Thomson Scattering in Burning Plasmas[1] V.V. MIRNOV, E. PARKE, D.J. DEN HARTOG, University of Wisconsin-Madison — Incoherent Thomson scattering (TS) is routinely used for electron temperature measurement, with T_e proportional to the width of the scattered spectrum. The polarization of the light is changed during the scattering process, an effect that becomes large in high-temperature burning plasmas and is typically described by the relativistic depolarization factor q. This factor quantifies the reduction of scattered spectral intensity collected by a detector with a specific polarization sensitivity. Our employment of the relativistic scattering operator, Stokes vectors and Mueller matrix formalism enables a more general approach that follows a major steps presented in [S. E. Segre and V. Zanza, Phys. Plasmas **7**, 2677 (2000)] with some important corrections and improvements. The superposition effect caused by a large number of randomly moving electrons in the scattering volume renders the scattered radiation partially polarized, and is quantified by the degree of polarization p. Because of different definitions of q and p their contribution to depolarization in TS is sometimes misinterpreted. The relationship between these two factors will be described.

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