Abstract Submitted
for the TSS15 Meeting of
The American Physical Society

Propagation Velocity in High Temperature Media MARTIN RANGEL, ALEXANDER BRATVEDT, SAMINA MASOOD, University of Houston Clear Lake — Elements of the propagation velocity in high temperature media are modeled utilizing thermally dependent functions for the permeability and permittivity of the medium. Two general solutions are formulated giving constraints of both electric and magnetic conditions of the medium as well as a form that isolates each of the thermally dependent functions. In order to validate a more elaborate model of the medium the solutions for propagation velocity and first order corrections to one-loop vacuum polarization are calculated and compared to known values. Reformulation also produces a plasma frequency which can be produced using the thermally dependent functions. Future work will include higher order corrections and computer modeling to further construct an efficient model for conditions present in the early universe. This construct will then be adjusted for chemical potential terms and other higher density factors in order to more successfully model vacuum, electron, and neutrino interactions in hot and dense media such as those found in neutron stars.

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Date submitted: 28 Jan 2015 Electronic form version 1.4