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**QED Plasma at Finite Temperature up to Two Loops** SAMINA MASOOD, University of Houston, Clear Lake — We study the vacuum polarization tensor of QED (quantum electrodynamics) up to the two loop level and its effect on the propagation of particles in QED medium. One loop corrections to QED coupling vanish at low temperatures ($T<10^{10}$ K), but they are significant at high temperature ( $T>10^{10}$ K). Due to the small contributions, higher loop corrections do not affect the convergence of perturbative series, and renormalizability of QED is guaranteed around neutrino decoupling temperature, at least. We use the renormalization scheme of QED at finite temperature in real-time formalism to study the dynamically generated mass of photon indicating the plasmon production in such a medium. Temperature dependence of QED plasma parameters is then calculated up to the two loop level.

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