

Real Time Ultrasoft Transverse Photons Self Energy at Next To-Leading Order in Hot Scalar Quantum Electrodynamics

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Abstract : We determine a compact analytic expression for the complete next-to-leading contribution to the retarded transverse photons self-energy in the context of hard-thermal-loop summed perturbation of massless quantum electrodynamics (QED) at high temperature to calculate the next-to-leading order dispersion relations for slow-moving transverse photons at high temperature scalar quantum electrodynamics (Scalar QED), using the real time formalism (RTF) in physical representation. We derive the analytic expressions of hard thermal loop (HTL) contributions to propagators and vertices to determine the expressions of the effective propagators and vertices in RTF that contribute to the complete next-to leading order contribution of retarded transverse photons self-energy.

Keywords : hard thermal loop, hot scalar QED, NLO computations, soft transverse photons

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