Bremsstrahlung emission from quark gluon plasma at finite baryon density

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Abstract

We calculate the photon production from a chemically equilibrating plasma with finite baryon density likely to be produced in RHIC (BNL) and LHC (CERN) energies. In the framework of thermal field theory, the photon production rate can be related to the imaginary part of the photon self energy, which at the one loop level in effective theory, consists of the annihilation and Compton processes and in the two loop level bremsstrahlung and the quark and antiquark annihilation with scattering (**aws**) [1]. Recently it has been shown that, photon production from the bremsstrahlung process contribute to the same order in the coupling constant as those of one loop diagrams both in equilibrated and equlibrating baryon free plasma[1,2]. Here we study the effect of baryon density on the photon production due to bremsstrahlung processes appearing in two-loop level with a simplified distribution function (MFD) [3] and we compare our result with the production from the one-loop processes. The photon production from two-loop processes is found to be enhanced due to baryon density and is comparable to that of one loop level. Further study with exact distribution function are in progress.

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