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Nucleon propagation in hot and dense nuclear matter

Content :

Spectral properties of nucleon in nuclear matter at finite temperature is studied in a relativistic framework, using real time thermal field theory. We have taken pi-nucleon and pi-delta loops and calculated the self energy function of the nucleon the imaginary parts of which are identified with the discontinuities across the unitary and Landau cuts. The spectral function of nucleon in hot and dense nuclear matter shows a large contribution at the nucleon pole coming from Landau cut which is not seen in case of nucleon propagation in vacuum.We find that in general both the cuts contribute to the spectral function even though unitary cut is ignored in the literature.Significance of unitary cut contribution in imaginary and real part of self energy function are also seen. The commonly used non-relativistic limit is also investigated.

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