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N=4 Super Yang-Mills Plasma
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Content :

The N=4 super Yang-Mills plasma is studied in the regime of weak coupling. Collective excitations and collisional processes are discussed. Since the Keldysh-Schwinger approach is used, the collective excitations in both equilibrium and non-equilibrium plasma are under consideration. The dispersion equations of gluon, fermion, and scalar modes are written down and the self-energies, which enter the equations, are computed in the Hard Loop Approximation. The self-energies are discussed in the context of effective action which is also given. The gluon modes and fermion ones appear to be the same as those in the QCD plasma of gluons and massless quarks. The scalar modes are as of free relativistic massive particle. The binary collisional processes, which occur at the lowest nontrivial order of the coupling constant, are reviewed and then the transport properties of the plasma are discussed. The N=4 super Yang-Mills plasma is finally concluded to be very similar the QCD plasma of gluons and light quarks. The differences mostly reflect different numbers of degrees of freedom in the two systems.

Summary :

Based on: A. Czajka & St. Mrowczynski, Phys.Rev. D86 (2012) 025017

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