

Chiral Imbalance Medium in Linear Sigma Model and Chiral Perturbation Theory

Wednesday 14 October 2020 16:10 (25 minutes)

In a chirally-imbalanced medium we compare some constraints on parameters both in the linear sigma model (LSM) and in the chiral perturbation theory (ChPT) as realizations of low energy quantum chromodynamics (QCD) for light mesons. The relations between the low-energy constants of the chiral Lagrangian and the corresponding constants of the linear sigma model are established as well as the expressions for the decay constant of the pion and the mass of the a_0 mesons in chiral medium are found. A possible experimental detection of chiral- imbalance medium (and therefore a phase with Local Parity Breaking) potentially can be found in the charged pion decays inside the fireball.

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Session Classification: Section 4. Relativistic nuclear physics, elementary particle physics and high-energy physics

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