Neutral pion screening mass in a magnetized medium

Content

We use the linear sigma model with quarks to study the magnetic-field-induced modifications on the longitudinal and transverse screening masses for the neutral pion at one-loop level. The effects of the magnetic field are introduced into the self-energy, which contains the contributions from all the model particles. We find that, to obtain a reasonable description for the behavior with the field strength, we need to account for the magnetic field dependence of the particle masses. We also find that the couplings need to decrease fast enough with the field strength to then reach constant and smaller values as compared to their vacuum ones. The results illustrate the need to treat the magnetic corrections to the particle masses and couplings in a self-consistent manner, accounting for the backreaction of the field effects for the magnetic field dependence of the rest of the particle species and couplings in the model.

Summary

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