Contribution ID: **57** Type: **Talk**

Magnetic field-dependence of the neutral pion mass in the linear sigma model coupled to quarks: The weak field case

Monday, 6 May 2019 14:50 (20 minutes)

We compute the neutral pion mass dependence on a magnetic field in the weak field approximation at one-loop order. The calculation is carried out within the linear sigma model coupled to quarks and using Schwinger's proper-time representation for the charged particle propagators. We find that the neutral pion mass decreases with the field strength provided the boson self-coupling magnetic field corrections are also included. The calculation should be regarded as the setting of the trend for the neutral pion mass as the magnetic field is turned on.

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Track Classification: STARS