

Nambu-Jona-Lasinio model at strong constant magnetic field

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In this work we calculate corrections to the NJL model coupling constant in the presence of a uniform magnetic field. Starting with the Nambu-Jona-Lasinio Lagrangian coupled with a $U(1)$ gauge field, namely a magnetic field, the background field method is employed. By expanding the quark determinant in terms of the quark bilinears we show that the first-order term provides a correction to the quark masses that corresponds to the one from the gap equation.

The second-order term of the expansion provides a correction to the NJL coupling constant, which decreases with increasing magnetic field.

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