

# Pion and Rho Meson Decay Constants in a Magnetic Background from QCD Sum Rules

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## Content

We investigate the behavior of pion and rho meson decay constants in the presence of a uniform external magnetic field oriented along the z-axis. The analysis is based on the study of two-point correlation functions  $hAA_i$ ,  $hAP_i$ ,  $hPP_i$ , and  $hVV_i$ , where A, V, and P denote axial-vector, vector, and pseudoscalar currents, respectively. The quark propagators are described using the Schwinger formalism, considering the weak-field expansion, and in the hadronic side we use Landau-level quantization. The study is carried out within the framework of QCD sum rules, where the QCD side of the correlators is evaluated perturbatively and through the operator product expansion (OPE), incorporating quark and gluon condensates to account for nonperturbative effects. This approach allows us to explore how an external magnetic field modifies the structure of hadronic correlators and, consequently, the decay constants. The results provide insight into the interplay between chiral symmetry breaking and electromagnetic effects in magnetized QCD matter, relevant to both heavy-ion collisions and compact astrophysical environments.

**Primary author(s) :** Mr. MIGUEL, Rosas (Universidad del Bio Bio); Dr. VILLAVICENCIO, Cristian (Universidad del Bio-Bio)

**Presenter(s) :** Mr. MIGUEL, Rosas (Universidad del Bio Bio)

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