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Determination of data driven magnetic dipole moment of vector mesons

We present the first determination of the magnetic dipole moment of the ρ and K^* vector mesons, based on data from the BaBar Collaboration. We analyze the $e^+e^- \rightarrow \pi^+\pi^-2\pi^0$ and $e^+e^- \rightarrow K^+K^-2\pi^0$ processes which are sensitive to this parameter. We describe the $\gamma^* \rightarrow \text{hadrons}$ vertex using a vector meson dominance model, including the relevant intermediate resonant contributions. We find $\mu_\rho = 2.7 \pm 0.3$ in $e/2m_\rho$ units for the ρ and $\mu_{K^*} = 4.5$ in $e/2m_{K^*}$ units. For this last, we stress the need for higher precision data to extract a more precise value of this parameter to confront it with theoretical predictions.

Academic position of the presenting author

Professor

Primary author: TOLEDO, Genaro (Instituto de Física, UNAM)

Co-authors: Dr ROJAS, Antonio (IFUNAM); Mr JIMÉNEZ PÉREZ, Luis A. (IFUNAM)

Presenter: TOLEDO, Genaro (Instituto de Física, UNAM)

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