

Meson transition form factor measurements from A2

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Collaboration

A2

Abstract content

A meson transition form factor (TFF) describes the dynamics of the transition between photons and mesons and hence provides an important probe of the intrinsic structure of mesons. High statistics measurements of TFFs also play a role for the precision frontier of the Standard Model (SM). In the SM calculation of the anomalous magnetic moment of the muon, the largest uncertainty is given by the hadronic part in which the hadronic Light-by-Light (hLbL) scattering plays a significant role. The largest individual contribution to the hLbL is an exchange of light pseudoscalar mesons coupling to two virtual photons. This coupling is in turn described by the corresponding TFF.

The A2 experiment at MAMI provides a high yield of light mesons produced by photo-induced reactions on protons, which makes the experiment ideal for precision measurements of meson TFFs. The A2 collaboration has recently published results of TFFs obtained by studies of Dalitz decays of the π^0 and η mesons as well as the $\omega \rightarrow \pi^0 e^+ e^-$ decay. For the study of the η' Dalitz decay, data has been collected and is being analyzed. And as a future endeavor, A2 will perform a dedicated measurement of the π^0 TFF with statistics increased by several factors compared to the previous A2 result.

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