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Kinematic dependences of ϕ meson spin-density matrix elements extracted from all HERMES data

Spin-density matrix elements (SDMEs) for exclusive ϕ meson lepton production were extracted using the 27.6 GeV HERA longitudinally polarized lepton beam and longitudinally or transversely polarized or unpolarized hydrogen and deuterium gas targets. The Q^2 and t' dependences of SDMEs determined in the kinematic region $1 < Q^2 < 7 \text{ GeV}^2$, $t' > -0.4 \text{ GeV}^2$, $W^2 > 4 \text{ GeV}^2$, extracted from the whole HERMES data set, are presented for the first time. Based on the extracted values of SDMEs one can test the s-channel helicity conservation hypothesis. Presence of unnatural parity exchange mechanism of ϕ meson production may also be checked.

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