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Determination of Transverse Charge Density from Kaon Form Factor Data[1] JOHANN MEJIA-OTT, TANJA HORN, IAN PEGG, NICHOLAS MECHOLSKI, MARCO CARMIGNOTTO, SALINA ALI, Catholic Univ of America — At the level of nucleons making up atomic nuclei, among subatomic particles made up of quarks, K-mesons or kaons represent the most simple hadronic system including the heavier strange quark, having a relatively elementary bound state of a quark and an anti-quark as its valence structure. Its electromagnetic structure is then parametrized by a single, dimensionless quantity known as the form factor, the two-dimensional Fourier transform of which yields the quantity of transverse charge density. Transverse charge density, in turn, provides a needed framework for the interpretation of form factors in terms of physical charge and magnetization, both with respect to the propagation of a fast-moving nucleon. To this is added the value of strange quarks in ultimately presenting a universal, process-independent description of nucleons, further augmenting the importance of studying the kaon's internal structure. The pressing character of such research questions directs the present paper, describing the first extraction of transverse charge density from electromagnetic kaon form factor data. The extraction is notably extended to form factor data at recently acquired higher energy levels, whose evaluation could permit more complete phenomenological models for kaon behavior to be proposed.

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