Meson Charge Radii and AMBER: Perspective for Kaon radius

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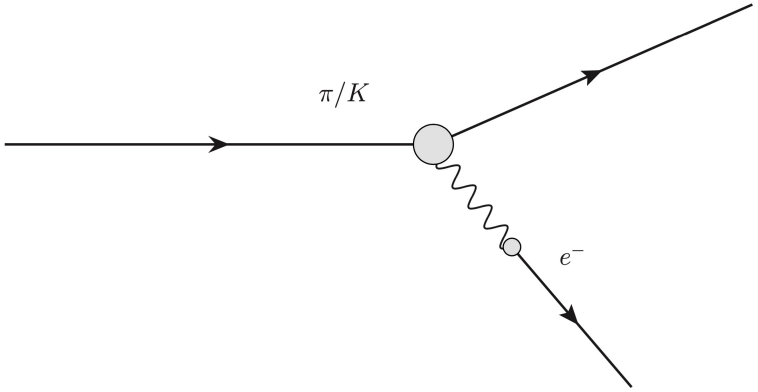
zoom

Kinematics



$$K^- \; e^-_{target} \rightarrow \; K^- \; e^-$$

$$s = 2E_b m_e + m_b^2 + m_e^2$$

$$Q^2_{max} = \frac{4p_b^2 \, m_e^2}{s}$$

Beam	E_b [GeV]	Q^2_{max} [GeV²]	$E'_{b,min}$ [GeV]	Relative charge-radius effect on c.s. at Q^2_{max}
π	190	0.176	17.3	~40%
K	190	0.086	105.7	~20%
	80	0.066	59.9	~15%
	50	0.037	41.3	~8%

Summary

- Meson radii are of key interest in understanding their inner structure and the emergence of hadron mass
- For pions, some deeper investigations would be needed to see whether and how the data of previous experiments can be challenged
- For kaons, a significant increase of the form factor knowledge in the range $0.001 < Q^2 < 0.07$ appears in reach with an 80 GeV *rf-separated kaon beam* and one beam time, that may be related to Primakoff data taking. However, a hydrogen target is preferable to increase the the fraction of K-e events