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Light Meson Structure in Jefferson Lab Hall C - Recent Measurements and Future Prospects

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One of the most puzzling aspects of the Standard Model is that the overwhelming majority of the mass of hadronic systems arises from massless and nearly massless objects. From the little that we do understand, we know that mass generation is intricately connected to the internal structure of hadronic systems. Somewhat counter intuitively, it is some of the lightest hadronic objects, the charged pion and kaon, that may be able to fill in the missing piece of the puzzle. One potential window into the internal structure of the charged pion and kaon is their elastic electromagnetic form factors, $F_\pi(Q^2)$ and $F_K(Q^2)$. Electromagnetic form factors are fundamental quantities which describe the spatial distribution of partons within a hadron. Determining these form factors, as well as how they vary with Q^2, is an important step on our road to understanding the internal structure of these objects.

JLab Hall C recently acquired data which has the potential to push the Q^2 reach of these form factor measurements deep into unexplored territory. These cutting edge measurements could help disentangle the emergent mass generation mechanisms of QCD. In doing so, we can map out and understand how QCD behaves across a range of energy scales and ultimately, map out the ground and excited states of QCD in one picture. In this talk, I will outline these recent measurements and the current progress of the data analysis. The interplay and connections between these measurements and N^* spectroscopy will be highlighted. I will also discuss future prospects for pion and kaon structure measurements.

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