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Stranger Things –Investigating Hyperon Structure at the Femtometer Scale

Friday, 4 August 2023 09:00 (35 minutes)

During the last few years, our understanding of the proton size has increased tremendously thanks to efforts from theorists as well as dedicated experiments. Recent progress for the neutron triggers the question: What is the role of flavor in the strong interaction dynamics, that governs the femtometer structure of hadrons? With their strange quark content, the hyperons offer the perfect laboratory to answer this question. However, due to their short life-times ($\sim 10^{-10}$ s), most methods for measuring the structure of nucleons are not applicable for hyperons. Luckily, the hyperons have an advantage: through their decays, they reveal their spin properties. This is in contrast to nucleons, for which dedicated polarimeter detectors are needed for this purpose. From the experimentally accessible spin properties, the complex time-like electromagnetic form factors can be reconstructed. Furthermore, the form factors enable the extraction of quantities such as the charge radius. In my talk, I will demonstrate how spin properties can be exploited in structure measurements, present recent results from the electron-positron experiment BESIII and discuss the next steps on our journey towards an understanding of how quarks and gluons form the matter we are made of.

Primary author: Prof. SCHÖNNING, Karin (Uppsala University)

Presenter: Prof. SCHÖNNING, Karin (Uppsala University)

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