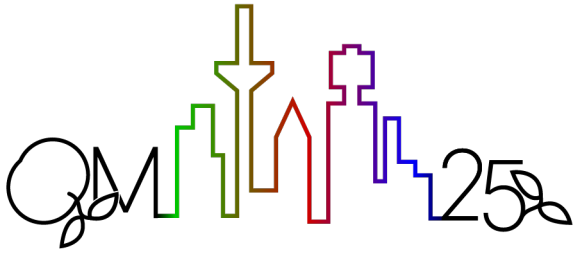

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The kaon anomaly in high-energy collisions

An excess of charged versus neutral kaons has been recently reported by the NA61/SHINE collaboration. Similar excesses were also present in previous experiments, even if with larger errors. Models for hadron productions in heavy ion collisions systematically underestimate the measured charge-to-neutral kaon ratio. In fact, using well-established models for hadron production, we demonstrate that known isospin-symmetry breaking effects and the initial nuclei containing more neutrons than protons lead only to a small (few percent) deviation of the charged-to-neutral kaon ratio from unity at high energies. The significance of the isospin-symmetry violation beyond the known effects is 4.7σ when the compilation of world data with uncertainties quoted by the experiments is used. New systematic, high-precision measurements and theoretical efforts are needed to establish the origin of the observed large isospin-symmetry breaking.

Category

Theory

Collaboration (if applicable)

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