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Exploring strange hadronic matter through femtoscopy at the LHC

Understanding the interactions among strange hadrons is crucial for developing a realistic equation of state of nuclear matter in dense environments as in the interior of neutron stars. In recent years, significant theoretical progress has been achieved through Effective Field Theories, which provide interaction models anchored to experimental data, and through Lattice QCD calculations that enable first-principles studies of baryon-baryon and meson-baryon interactions. On the experimental side, major efforts at facilities such as DAΦNE, J-PARC, RHIC, FAIR, and the LHC have yielded increasingly precise measurements aimed at constraining and validating theoretical predictions. In this contribution, I will highlight the main achievements in this field, with a focus on the femtoscopy technique at the LHC. This method has provided the most precise information to date on the low-energy dynamics of several particle pairs in the strangeness sector, including systems with double and triple strangeness. Recent extensions to the three-body systems further demonstrate the capability of femtoscopy to investigate few-body dynamics for strange hadrons with unprecedented precision. Finally, I will discuss the implications of these measurements for our understanding of the equation of state of neutron stars.

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