FZU Institute of Physics of the Czech Academy of Sciences

Invitation

to the seminar of Division of Elementary Particle Physics of the Institute of Physics of the Czech Academy of Sciences

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From femtoscopic measurements at the LHC to the core of Neutron Stars

Abstract: Neutron stars provide a unique environment for studying matter at densities far beyond those reached in ordinary nuclei. In such conditions, strange baryons, such as Λ and Ξ hyperons, may appear in the stellar core. Their presence, however, reduces the maximum neutron-star mass below the values observed astrophysically. Resolving this issue requires a better understanding of hyperon–nucleon interactions, particularly hyperonic three-body forces. So far, efforts to include three-body contributions in the calculations have relied on limited experimental input from hypernuclei, used to constrain the low-energy constants of effective field theories. Existing data remain scarce, especially for Ξ hyperon systems. Femtoscopic measurements in high-energy collisions at the LHC offer a complementary approach to probe hyperon–nucleon–nucleon interactions, with preliminary studies of the p–p–Λ correlation function indicating sensitivity to three-body forces. In this contribution, recent measurements and developments in p–p–Λ correlations across different collision systems are presented, together with new results on p–p–Ξ correlations probing systems with double strangeness and future perspectives.

When: Thursday, June 4, 2026 at 2PM

Where: Dvořák hall, FZU, Pod Vodárenskou věží 1, Prague

For more information, please see https://indico.fzu.cz/event/338/

Roman Lysák Jiří Hejbal