ID de Contribution: **50** Type: **Non spécifié**

Inside the tetraneutron: correlations within the 4n system

mercredi 6 novembre 2024 11:10 (25 minutes)

Light multineutron systems represent a severe test for our understanding of nuclei. They are composed of only one type of particle, connected by only one (nuclear) force, and can be calculated by ab-initio exact models. As such, the observation of events in the dissociation of 14Be consistent with the detection at the 2 sigma level of a weakly bound or unbound tetraneutron [1,2] led not only to a theoretical reappraisal of the 4n system [3], but also motivated renewed experimental efforts. In particular, work at RIKEN in two experiments using 8He beams and the missing-mass technique, first with double-charge exchange [4] and later with alpha knockout [5], exhibited a relatively narrow structure near threshold (respectively with 4.9 and »5 sigma significance) at about 2.4 MeV in the 4n continuum [5]. There is, however, no clear consensus on the interpretation of this near-threshold structure [6], in particular whether it is a true resonance or rather a correlated system that reflects the character of the 4n in the initial state [7]. We will discuss the next steps in this field, involving the direct meassurement of the multineutron invariant mass and the exploration of internal correlations in the system.

[1] F.M. Marqués et al., Phys. Rev. C 65, 044006 (2002).
[2] F.M. Marqués et al., arXiv:nucl-ex/0504009.
[3] F.M. Marqués and J. Carbonell, Eur. Phys. J. A 57, 105 (2021).
[4] K. Kisamori et al., Phys. Rev. Lett. 116, 052501 (2016).
[5] M. Duer et al., Nature 606, 678 (2022).
[6] L.G. Sobotka and M. Piarulli, Nature 606, 656 (2022).
[7] R. Lazauskas et al., Phys. Rev. Lett. 130, 102501 (2023).

Auteur principal: MARQUES, Miguel (LPC-Caen)

Orateur: MARQUES, Miguel (LPC-Caen)