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Relevance of neutron excess in nuclear matter to proton-induced composite-particle pre-equilibrium emission

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Studies of the surface of heavy nuclei provides information on the equation of state (EoS) at densities lower than the nuclear saturation density [1, 2]. At these low densities cluster correlations are predicted, with alpha clusters being of special interest. The isotopes of Sn are convenient examples for an experimental test of predictions from a generalized relativistic density functional theoretical approach [2]. In fact, a recent comparison between experimental alpha transfer cross sections on 112, 116, 118, 120, 124Sn and theoretical expectation provides consistent results [3]. In view of our current understanding of the reaction mechanism of proton-induced pre-equilibrium alpha-particle emission [4], it is expected that the extent of alpha-cluster correlations as a function of neutron excess should influence especially the analyzing power angular distribution in a characteristic way.

Recent insight into the mechanism of proton-induced composite-particle pre-equilibrium emission and its relevance to EoS results will be discussed.

- [1] S. Typel EPJ Web of Conferences 88, 01016 (2015).
- [2] S. Typel, Phys. Rev. C 89, 064321 (2014).
- [3] A. A. Cowley, Phys. Rev. C 93, 054329 (2016).
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Selected session

Nuclear Structure, Spectroscopy and Dynamics

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