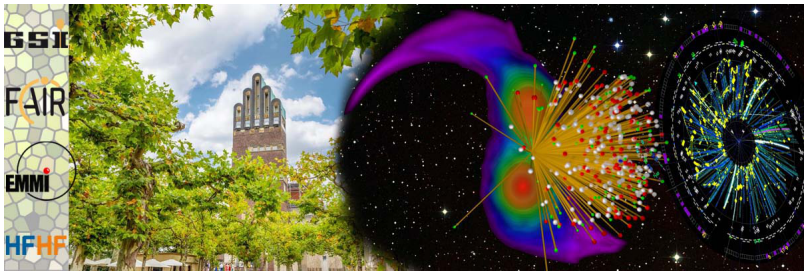

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Nuclear symmetry energy from isobar collisions at RHIC

Wednesday, 20 September 2023 15:00 (30 minutes)

Isobar $^{96}_{44}$Ru+$^{96}_{44}$Ru and $^{96}_{40}$Zr+$^{96}_{40}$Zr collisions at nucleon-nucleon center-of-mass energy of 200 GeV at the Relativistic Heavy Ion Collider (RHIC) were initially proposed as a decisive experiment on the chiral magnetic effect, presuming identical QCD background [1]. They turned out to be rather different, by, for instance, as large as 5% in multiplicity [2]. Such a difference roots in the differing nuclear structures of the $^{96}_{44}$Ru and $^{96}_{40}$Zr nuclei, the latter having a significantly thicker neutron skin. This is predicted by energy density functional calculations [3] and can be utilized to probe the nuclear symmetry energy [4]. In this talk, I will present the density slope parameter of the symmetry energy extracted from the isobar data at RHIC. I will detail the systematics due to model dependencies, which are distinct from those in low-energy scattering experiments, highlighting the importance of such a measurement at RHIC. I will end with a set of outlooks bridging the subfields of nuclear structure and high-energy nuclear collisions.
[1] Sergei A. Voloshin, Phys.Rev.Lett. 105 (2010) 172301
[2] STAR Collaboration, Phys.Rev.C 105 (2022) 1, 014901
[3] Hao-jie Xu et al. Phys.Rev.Lett. 121 (2018) 022301
[4] Hanlin Li et al., Phys.Rev.Lett. 125, 222301 (2020)

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