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Nuclear Charge Radii of Silicon Isotopes

The nuclear charge radius of ^{32}Si was determined from isotope-shift measurements performed at the collinear laser spectroscopy setup BECOLA at the Facility for Rare Isotope Beams (FRIB, Michigan State University). The extracted charge radius was compared to ab initio nuclear lattice effective field theory, valence-space in-medium similarity renormalization group and mean field calculations. Furthermore, the charge radius of ^{32}Si completes the radii of the mirror pair ^{32}Ar - ^{32}Si , whose difference was correlated to the slope ∂ of the symmetry energy in the nuclear equation of state [1]. We will present the experimental details including the production of a ^{32}SiO beam in the batch mode ion source and molecular break-up at BECOLA as well as the results and their implications for nuclear structure and the nuclear equation of state.

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[1] arXiv:2309.02037 [nucl-ex]

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