



Contribution ID: 315

Type: **Workshop**

## Study on short-range correlations in unstable neutron-rich nuclei

*Friday, 1 December 2023 17:35 (25 minutes)*

The short range correlation (SRC), is a peculiar new phenomenon that is relevant to the most dense part of the nucleus, as the SRC happens when the nucleon-nucleon pair is close to each other by only about a half of their normal average distance. Due to the Heisenberg's uncertainty principle, the SRC nucleons have much higher momentum than the Fermi momentum, contrary to the conventional, standard picture of nuclei where nucleon momenta are limited to the Fermi momentum. To establish a comprehensive understanding of nuclei, new insights from experimental and theoretical investigations on SRC are required.

So far, the SRC has been studied only for "stable" nuclei. One of the current issues on SRC is how the asymmetry of proton and neutron numbers affect the SRC. To address the question, unstable neutron-rich nuclei provide a great opportunity. Unstable neutron-rich nuclei typically have large neutron excess, which enables to study the proton-neutron-asymmetry dependence in a wide range. Furthermore, the question how SRC pair behaves in extreme neutron-rich environment arises and such a question may provide key information on the equation of state for neutron stars.

Aiming at studying the SRC in neutron-rich short-lived nuclei, we propose a novel method, namely proton-induced deuteron-knockout reaction with fast beams of unstable neutron-rich nuclei in inverse kinematics, to measure the momentum distribution inside SRC pairs. The experiment will be conducted using the SAMURAI spectrometer at the RI beam factory, RIKEN. In this presentation, the new method will be discussed, and experimental details will be given.

### Attendance Type

In-person

**Primary author:** WANG, He

**Presenter:** WANG, He

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