



Contribution ID: 206

Type: **Contributed Oral Presentation**

## Exploring high-density matter at J-PARC Heavy-Ion Project (J-PARC-HI)

*Friday, 30 May 2025 11:40 (15 minutes)*

J-PARC is one of the world's highest-intensity proton accelerators for material and life sciences, neutrino physics, and hadron and nuclear physics in a few ten GeV energy range. J-PARC-HI (J-PARC Heavy-Ion Project) aims to accelerate heavy-ion beams at J-PARC. A new heavy-ion injector consisting of a new heavy-ion linac and a booster ring are required, while heavy-ion beams from the injector can be accelerated in the existing 3-GeV synchrotron (RCS) and 30-GeV synchrotron (MR). The maximum beam rate is expected to reach the world's highest rate of  $10^{11}$  Hz, and the energy can vary from 1 to 12 AGeV/c. We will explore QCD phase structures such as the first-order phase boundary, the QCD critical point, and color superconducting phases in a high-baryon density regime in the QCD phase diagram, using various probes such as event-by-event fluctuations, dileptons, collective flow, and two-particle correlations. We also search for various multi-strangeness particles/nuclei and study hadron-hadron interactions including strangeness.

In this talk, we will focus on physics goals, and experimental plans including the staging strategy with a low-intensity injector and an experiment at the existing J-PARC E16 spectrometer (Phase 1), and with a high-intensity injector and an experiment with a new large acceptance spectrometer (Phase 2). We will show the status of the dilepton and hadron measurements in p+A collisions at J-PARC which serves as a baseline experiment for J-PARC-HI. Then, we will show the physics and experime

**Primary author:** Dr SAKO, Hiroyuki (Japan Atomic Energy Agency)

**Presenter:** Dr SAKO, Hiroyuki (Japan Atomic Energy Agency)

**Session Classification:** Parallel Session

**Track Classification:** New Facilities and Instrumentation