

Facility for Heavy Ion Collision Experiment at RAON

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The Rare Isotope Science Project (RISP) was established in December 2011 in order to carry out the technical design and the establishment of the accelerator complex (RAON) for the rare isotope science in Korea. The rare isotope accelerator at RAON will provide both stable and rare isotope heavy-ion beams with the energy ranges from a few MeV/nucleon to a few hundreds of MeV/nucleon for the researches in fields of basic and applied science.

Large Acceptance Multipurpose Spectrometer (LAMPS) at RAON is a heavy-ion collision experimental facility for studying nuclear symmetry energy by using rare isotope beams. Two different experimental setups of LAMPS are designed for covering entire energy range at RAON.

One is for a low energy (< 18.5 MeV/nucleon) heavy-ion collision experiment for day-1 experiments. This experimental setup is consisted of cluster array using $\Delta E-E$ technique with Si+CsI detectors, NaI gamma array to cover backward polar angle, and forward neutron wall.

The other is for completing an event reconstruction by detecting the all particles produced from high energy heavy-ion collisions within large acceptance detector to measure particle spectrum, yield, ratio and collective flow of pions, protons, neutrons, and intermediate fragments at the same time. The experimental setup is consisted of superconducting spectrometer, dipole spectrometer, and forward neutron wall. Time Projection Chamber (TPC) will be placed inside of superconducting solenoid magnet of 0.6 T for charged particle tracking device. The dipole spectrometer will be located at forward superconducting spectrometer and it will be composed with the combination of quadruple, dipole magnets, focal plane detector, tracking stations, and Time-of-Flight (ToF) detector at the end. The neutron wall will be made of 10 layers of plastic scintillators for neutron tracking.

In this presentation, the detail physics and design of LAMPS at RAON will be discussed.