

Abstract Submitted
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Development of a Ge detector array for γ -ray spectroscopy of hypernuclei at J-PARC TAKESHI YAMAMOTO, Dept. of Physics and Astronomy, Tohoku University, Sendai, Japan, HYPERBALL-J COLLABORATION — At the J-PARC facility, several light hypernuclei will be studied via γ -ray spectroscopy at the K1.8 beam line as a Day-1 experiment (E13). γ rays from the hypernuclei are detected by a new germanium (Ge) detector array, Hyperball-J (HBJ), for an ultra high energy deposit rate. The array consists of 32 coaxial Ge detectors surrounded by newly developed PWO counters for fast background suppression. The simulated absolute photo-peak efficiency of HBJ is 5.8% for 1-MeV γ ray, which allows for γ - γ coincidence in hypernuclear spectroscopy. Firstly, since the beam intensity is higher than the last experiment at KEK, HBJ will be operated with mechanical cooling for radiation-hardness with the crystal cooled down to below 70 K. The Ge sensor-cooler unit has comparable energy resolution with that of the LN₂ cooling. Without a dewar, dense placement of detectors has become possible with adjustable geometry. Secondly, PWO counters will be used in place of BGO counters for the first time. Doping and cooling of PWO crystals achieved the comparable performance to BGO counters even at an order of magnitude higher rate. Finally, HBJ control system has also been being developed. All HBJ components will be remotely controlled and monitored. Results of simulation and the current status of the array will be presented.

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