

Possibility of gamma-ray spectroscopy on hypernuclear resonance states with heavy ion collisions

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Recently, experiments to study hypernuclei by using induced reactions of stable heavy ion beams and rare isotope beams have been proposed at GSI by the HypHI collaboration. In the HypHI experiments, hypernuclei are formed by coalescence of hyperon(s) produced in the participant region of heavy ion collisions into projectile fragments, therefore, it is possible to produce neutron/proton rich hypernuclei. The HypHI collaboration currently prepares for the first Phase 0 experiment for light hypernuclei, which should take place in the beginning of 2009. Because of large momentum transfer to produced hypernuclei in heavy ion collisions, collective and dynamical excitation of hypernuclei could be populated, which can not be achieved by conventional hypernuclear productions with meson and electron beams. Since the velocity of produced hypernuclei is as large as the one of projectiles (at least 94 % of speed of light), it is impractical to perform gamma-ray spectroscopy for low energy collective motion by observing discrete gamma-lines, while the gamma-ray spectroscopy for the resonance states such as GDR by observing high energy gamma-rays by BaF2 detectors could be feasible. In the presentation, over view of the hypernuclear spectroscopy with heavy ion collisions and the idea of the spectroscopy for resonance states for neutron/proton rich hypernuclei will be discussed.

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