

HAW09-2009-000920

Abstract for an Invited Paper
for the HAW09 Meeting of
the American Physical Society

In-beam γ -ray spectroscopy at the RIBF: recent results and future prospects

HEIKO SCHEIT, RIKEN Nishina Center

With the commissioning of the BigRIPS projectile fragment separator and the ZeroDegree spectrometer at the Radioactive Ion Beam Factory (RIBF) at the RIKEN Nishina Center a new window to study nuclei far from stability has been opened. Various experimental methods can now be applied to exploit the intense and high-energy primary and secondary beams at the RIBF. In a first set of experiments in-beam γ -ray spectroscopy has proved to be a very promising tool to study exotic nuclei far from stability. The so-called DayOne experimental campaign was carried out at the RIBF in November and December 2008, which comprises a set of experiments using the same primary beam ^{48}Ca at 345 MeV/ u and similar, or at least non-interfering, experimental setups. During this campaign the first spectroscopic study of the N=22 nucleus ^{32}Ne was carried out. A single γ -ray transition with an energy of 722(9) keV was observed in both inelastic scattering of a 226 MeV/ u ^{32}Ne beam on a Carbon target and proton removal from ^{33}Na at 245 MeV/ u , which is assigned to the de-excitation of the first $J^\pi = 2^+$ state in ^{32}Ne to the 0^+ ground state. The low excitation energy and a comparison to state of the art shell model calculations demonstrate that the Island of Inversion extends to at least N=22 for the Ne isotopes. I will give a short overview of the existing facilities and then focus on the first experimental campaign carried out with BigRIPS and ZeroDegree. The experimental setup used for in-beam γ -ray spectroscopy will be introduced followed by a presentation of first results. An outlook will be given.