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Gamma-ray spectroscopy in the vicinity of ^{100}Sn

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The heaviest doubly-magic and self-conjugate nucleus ^{100}Sn is known for its super-allowed Gamow-Teller decay with the smallest log ft value
and providing experimental data for quenching effects and rp-process path models. In addition, ^{100}Sn and its neighbouring species offer valuable insights for nuclear structure.
Gamma-ray spectroscopy of ^{100}Sn
and nuclei in its vicinity with $N \simeq Z \simeq 50$ will probe single-particle/hole energies near the proton dripline, challenging
current large-scale shell models in this A and Z region.

The nuclei of interest were produced at RIKEN Rare Isotope Beam Factory in June 2013, where
a high-intensity (36 pnA, 2.3×10^{11} pps) ^{124}Xe beam with 345 MeV/u energy was fragmented on a 4-mm Be target. The fragments were identified via energy loss, magnetic rigidity and time-of-flight measurements with BigRIPS and the ZeroDegree Spectrometer. In total, 2035 events of ^{100}Sn were identified after 8.5 days of beamtime - the largest ^{100}Sn yield to date by a factor of 8. Many other exotic nuclei with similar A and Z were produced,including previously unobserved species such as ^{98}Sn and ^{96}In. These nuclei were implanted in WAS3ABi, a set of position-sensitive silicon strip detectors which measured ion implantation position, β^+ particles' position and energy. Subsequent β-delayed gamma-rays were measured with the EURICA spectrometer featuring high-resolution/efficiency HPGe clusters and fast-timing $LaBr_3$ detectors. Of the more abundantly produced nuclei, the level scheme for ^{98}Ag from the β^+-decay of ^{98}Cd has been reproduced with new candidate transitions. Preliminary analysis and level schemes of exotic fragmentation species will be presented.

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