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Beta decay studies around doubly magic ^{78}Ni

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The main motivations to study very neutron rich nuclei in the ^{78}Ni region are related to the evolution of nuclear structure and to the path of nucleosynthesis within rapid neutron capture. In particular, neutrons filling $g_{9/2}$ orbital between ^{68}Ni and ^{78}Ni affect spin-orbit splitting of proton single-particle states. An increasing beta- delayed neutron emission probabilities are changing the isobaric distributions of nuclei involved in the r-process. The report on the recent results on the decay of most neutron- rich isotopes of copper and gallium [1] will be presented. These proton-induced ^{238}U fission products were produced and studied at Holifield Radioactive Ion Beam Facility at Oak Ridge using a “ranging-out” method [2] for postaccelerated beams purification. In collaboration with Jeff Winger and Sergey Iliushkin, Mississippi State University; Carl Gross and Dan Shapira, ORNL; Carrol Bingham, UTK; Robert Grzywacz, ORNL; Chiara Mazzocchi, Sean Liddick, Steven Padgett, and Mustafa Rajabali, UTK; Jon Batchelder, UNIRIB-ORAU; Edward Zganjar and Andreas Piechaczek, LSU; Christopher Goodin and Joseph Hamilton, Vanderbilt University; and Wojciech Krolas, JIHIR Oak Ridge.

[1] J. Winger et al., contr. to INPC, Japan, June 2007

[2] C.J. Gross et al., EPJ A 25, s01, 115 (2005)