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Beta-delayed γ-spectroscopy of ^{71}Kr

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^{71}Kr was produced through the fragmentation of a ^{78}Kr primary beam at the RIKEN-RIBF facility in Japan, in order to have the first comprehensive study of its β-decay leading to its mirror counterpart (^{71}Br). The β-decay of ^{71}Kr has a significance from the astrophysical point-of-view, as it is a waiting point of the *rp*-process [1]. The question of the ordering of the ground state doublet of ^{71}Kr also remains open, with spin-parities $5/2^-$ and $1/2^-$ and an energy difference of 10 keV for ^{71}Br [2].

The fragments of ^{78}Kr were identified using standard ΔE-Bρ-ToF method [3]. A double-sided silicon strip array (WAS3ABi) was used for the implant and decay station [4]. The γ-rays were measured by a surrounding HPGe cluster array (EURICA) [5].

One of the main goals of the analysis was to derive the half-life of the β-decay using independent methods to rule out systematic uncertainties. We have used three methods: 1) Bateman-fit of implant-β time correlations, 2) exponential fit of implant-($\beta\gamma$) time correlations of verified γ-transitions, 3) exponential fit of implant-proton time correlations of β-delayed prompt proton emission.

The other goal was to build the decay-scheme of the β-decay. Level ordering and γ-transition intensities were validated using $\gamma\gamma$-coincidences and the balance of in- and outgoing γ-feeding of levels. Levels with $\log ft < 6$ have been identified and placed in the level-scheme, including 8 new levels and 26 new γ-transitions.

The probability of proton emission was also measured with a 50-fold increased precision compared to the earlier experimental value of [6]. The details of the analysis, the preliminary results and an outlook on theoretical interpretations will be presented.

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