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Supplementary material for Discovery of ^{72}Rb: A nuclear sandbank beyond the proton drip-line

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In this supplementary material we provide some detailed information about the experimental setup and results that are presented in the paper Discovery of ^{72}Rb: A submerged nuclear island beyond the proton drip-line. The data were collected in three settings of the BigRIPS spectrometer, which are summarised in Table I.

The full set of cross-sections from this experiment, together with previous experiments in the same region, are shown in Fig. 1 and Fig. 2. As can be seen in these figures, the EPAX cross-sections reproduce the experimental data well in the $A = 70$ region, with the largest descripancies being close to the drip line. In the $N = Z$ nuclei the cross sections are well known to be overestimated by a factor of 3-5.

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TABLE I: Summary of the three different settings used in this experiment. This table shows the cenral particle, target thickness, magnetic rigidity ($B\rho$), degrader thickness, slit openings relative to the central trajectory, location of the ionization chamber, total beam time, average beam current, and live time for each individual setting. For quantities common to all three settings, these are listed only in the central column.

Setting	1	2	3
Central particle		^{73}Sr	
Target		Be 40.3 mm	
$B\rho_{0,1}$		5.110 Tm	
Degrader F1		Al 3.98 mm	
$B\rho_{1,2}$		4.432 Tm	
Degrader F5		Al 3.50 mm	
$B\rho_{5,7}$		3.606 Tm	
F1 slit	+64.2/0	+64.2/+5	+64.2/-30
	-3.0%/0.0%	-3.0%/+0.23%	-3.0%/+1.40%
F2 slit	+3/-5	+25/+9	+14/+8
F5 slit		± 120	
F7 slit	+2/-10	+8/10	+6/-14
IC for ΔE		F11	
Time	36.4 h	1.74 h	3.72 h
Current	30.2 pnA	29.9 pnA	30.7 pnA
Live time	98.0 %	94.8 %	97.5 %

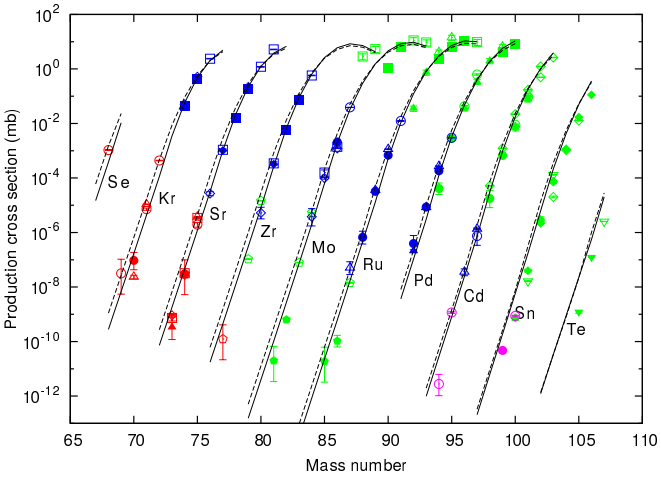

FIG. 1: Cross-section systematics for even-Z nuclei from the present experiment (red) and the associated cross-section measurement runs (blue), previous xenon-beam campaigns [1] (green), and the ^{100}Sn campaign [2] (magenta). The cross sections are compared to calculations based on EPAX3.1a and EPAX2.15.

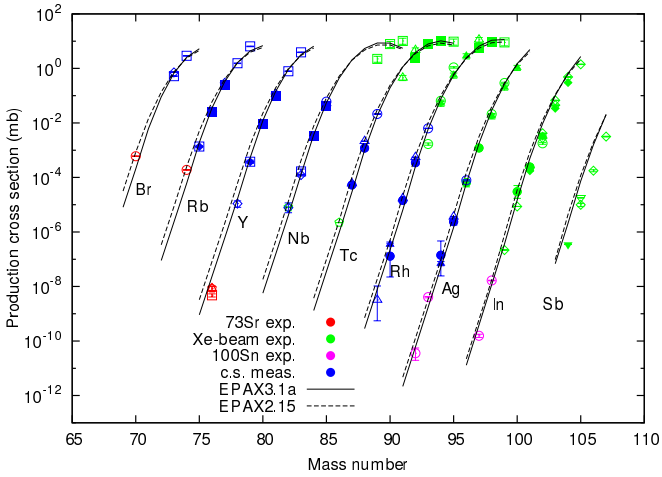

FIG. 2: Cross-section systematics for odd-Z nuclei from the present experiment (red) and the associated cross-section measurement runs (blue), previous xenon-beam campaigns [1] (green), and the ^{100}Sn campaign [2] (magenta). The cross sections are compared to calculations based on EPAX3.1a and EPAX2.15.

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