

## py-event rate estimate

Primary beam intensity ( $^{238}\text{U}$ )	$10^9$ particle/s
$^{208}\text{Pb}$ target ( $1\text{g}/\text{cm}^2$ )	$2.9 \cdot 10^{21}$ particle/ $\text{cm}^2$
transmission SIS-FRS	0.7
transmission through FRS	0.01

$$\text{RIB-event rate} = 2.03 \cdot 10^{28} [\text{s}^{-1} \text{cm}^{-2}] * \sigma_{\text{fission}} [\text{cm}^2]$$

$$\sigma_{\text{fission}} = 0.026 * 10^{-24} [\text{cm}] \text{ for } ^{88}\text{Kr}$$

RIB-event rate	$527 [\text{s}^{-1}]$ ( $^{88}\text{Kr}$ beam intensity)
max. event rate (MUSIC)	$10^4 [\text{s}^{-1}]$

### Coulomb excitation experiment:

$^{208}\text{Pb}$ Coulex-target ( $0.4\text{g}/\text{cm}^2$ )	$1.2 \cdot 10^{21}$ particle/ $\text{cm}^2$
photopeak efficiency	0.029

$$\text{py-event rate} = 6.80 \cdot 10^{47} [\text{s}^{-1} \text{cm}^{-4}] * \sigma_{\text{fission}} [\text{cm}^2] * \sigma_{\text{coulex}} [\text{cm}^2]$$

Raman formula: 
$$B(E2; 0^+ \rightarrow 2^+) = 3.33 * \frac{Z^2}{E_2 [\text{keV}]} * \frac{1}{A^{0.69}} [e^2 b^2]$$
$$B(E2; 0^+ \rightarrow 2^+) = 0.254 [e^2 b^2] \text{ for } ^{88}\text{Kr}, E_2 = 775. [\text{keV}]$$

$$\sigma_{\text{coulex}} = 0.491 * 10^{-24} [\text{cm}] \text{ for } ^{88}\text{Kr}, R_{\text{int}} = 13.5 [\text{fm}]$$

$$\text{py-event rate} = 0.009 [\text{s}^{-1}] = 0.52 [\text{min}^{-1}]$$