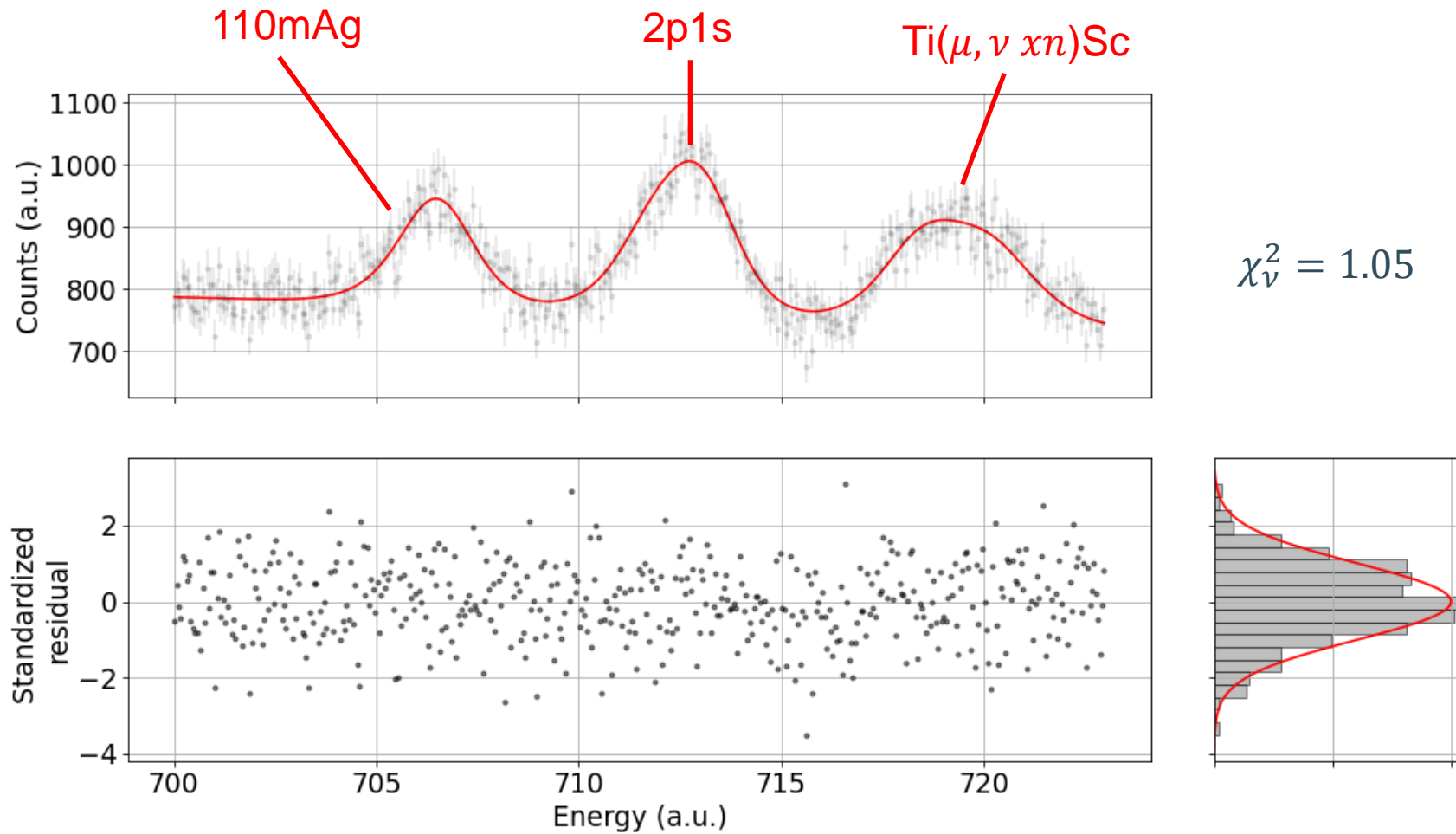


Update muX meeting 31/01

Michael Heines

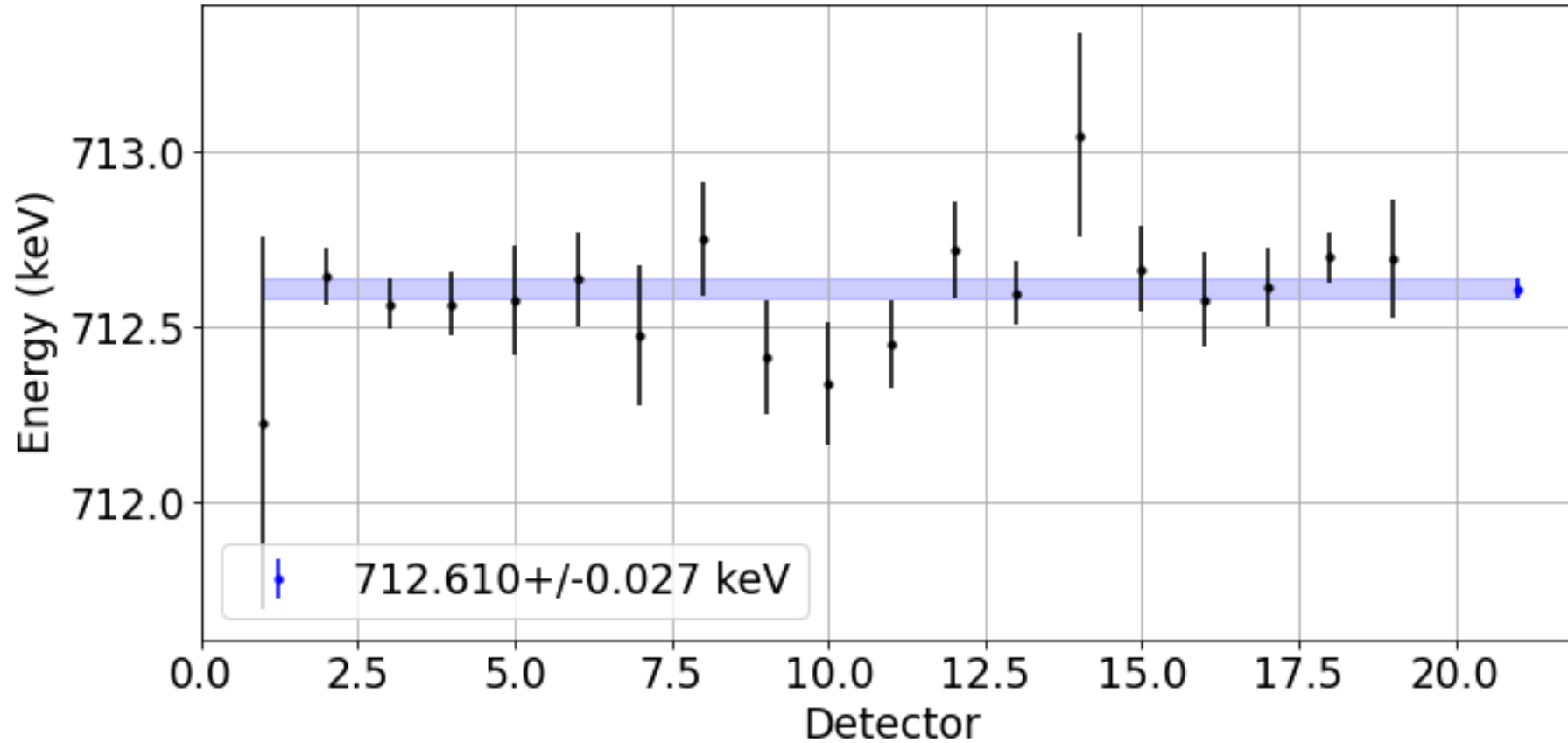
^{40}K fitting

Fitted spectrum

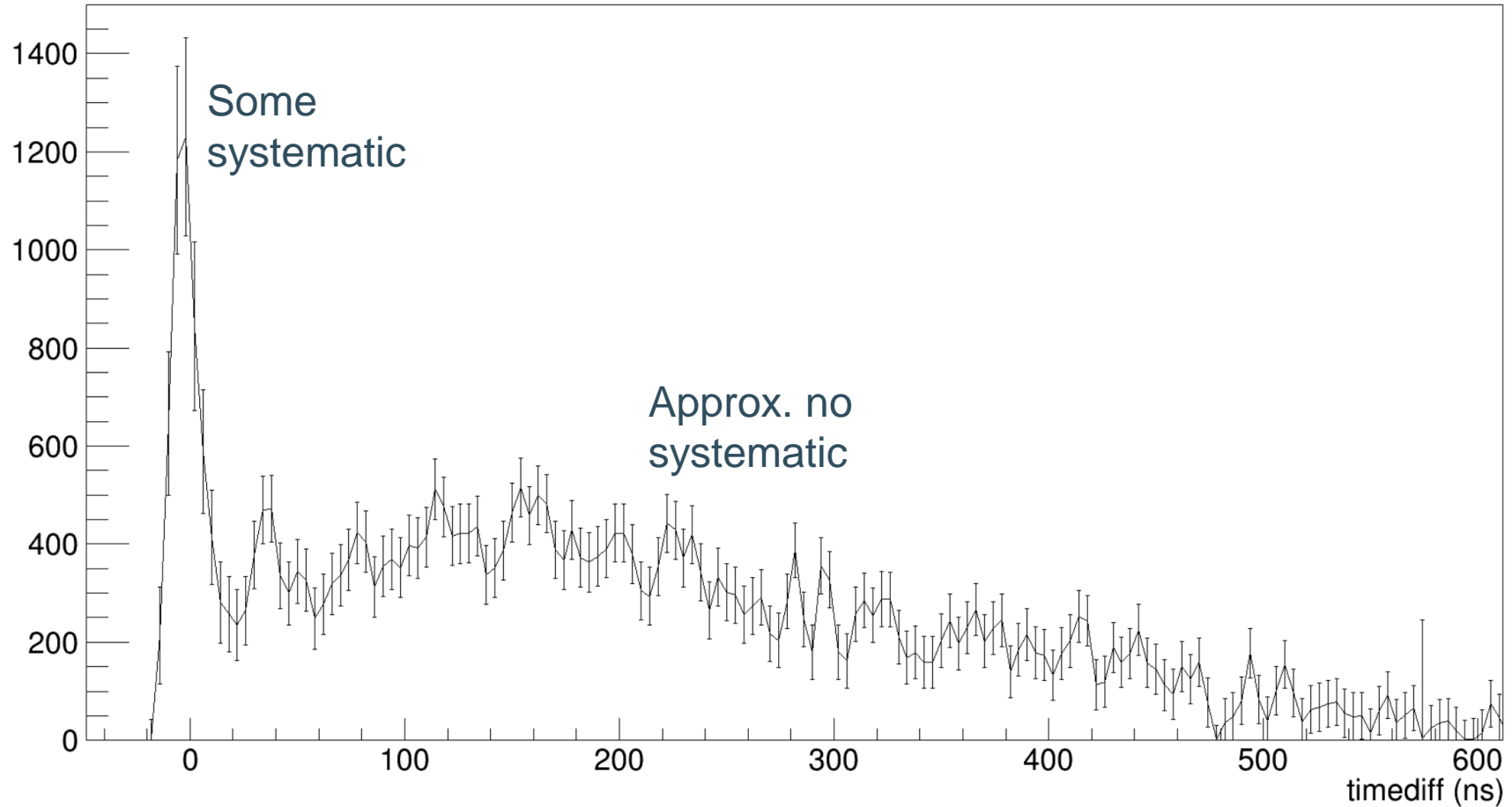


Averaging over detectors

$\chi^2_\nu = 0.72 \rightarrow \sim 20\%$ quantile in chisquare distribution



What about time cut systematics



Time cut systematic

$$E \rightarrow [-50, +150]ns$$

$$E_0 \rightarrow [-50, +60]ns$$

$$E_1 \rightarrow [+60, +150]ns$$

f is fraction in delayed part

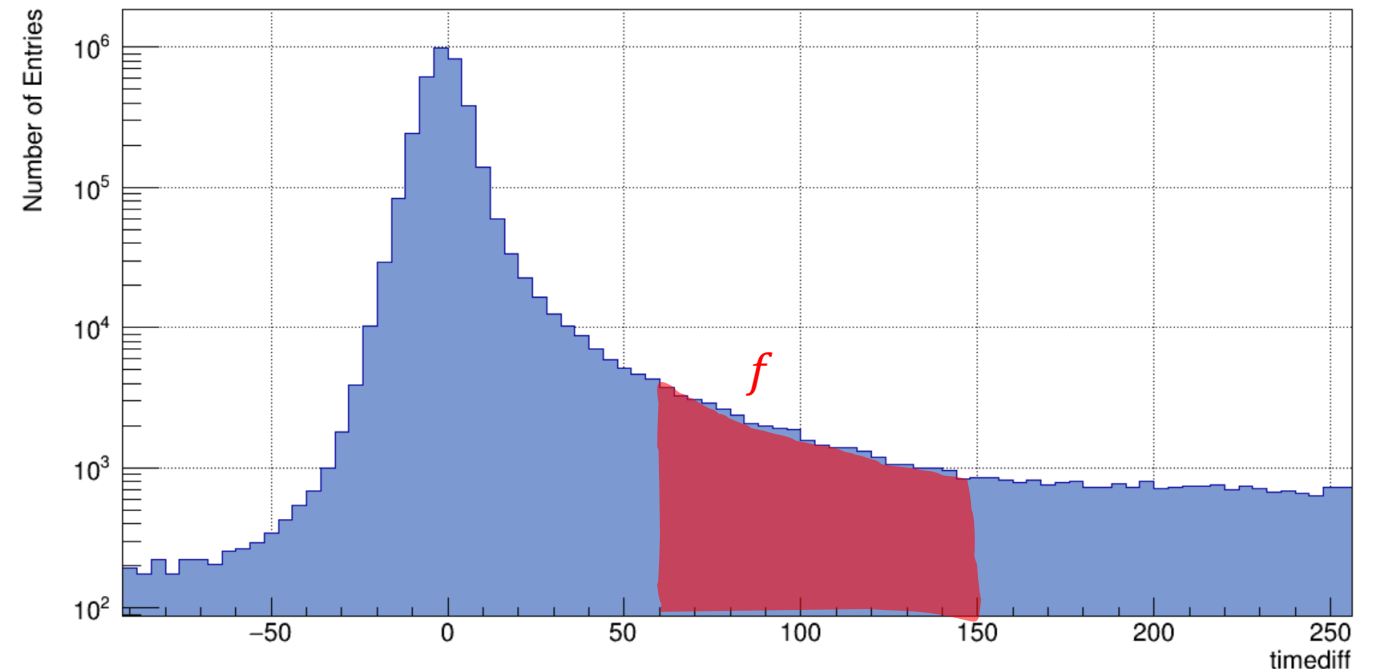
- Based on extracting averages:

$$E = E_1 f + (1 - f)E_0$$

$$E_1 = \frac{E + (f - 1)E_0}{f}$$

$$\Delta E = \frac{1 - f}{f} (E - E_0)$$

From ^{39}K data



Note: This plot is just a projection of the histogram, not based on fitting

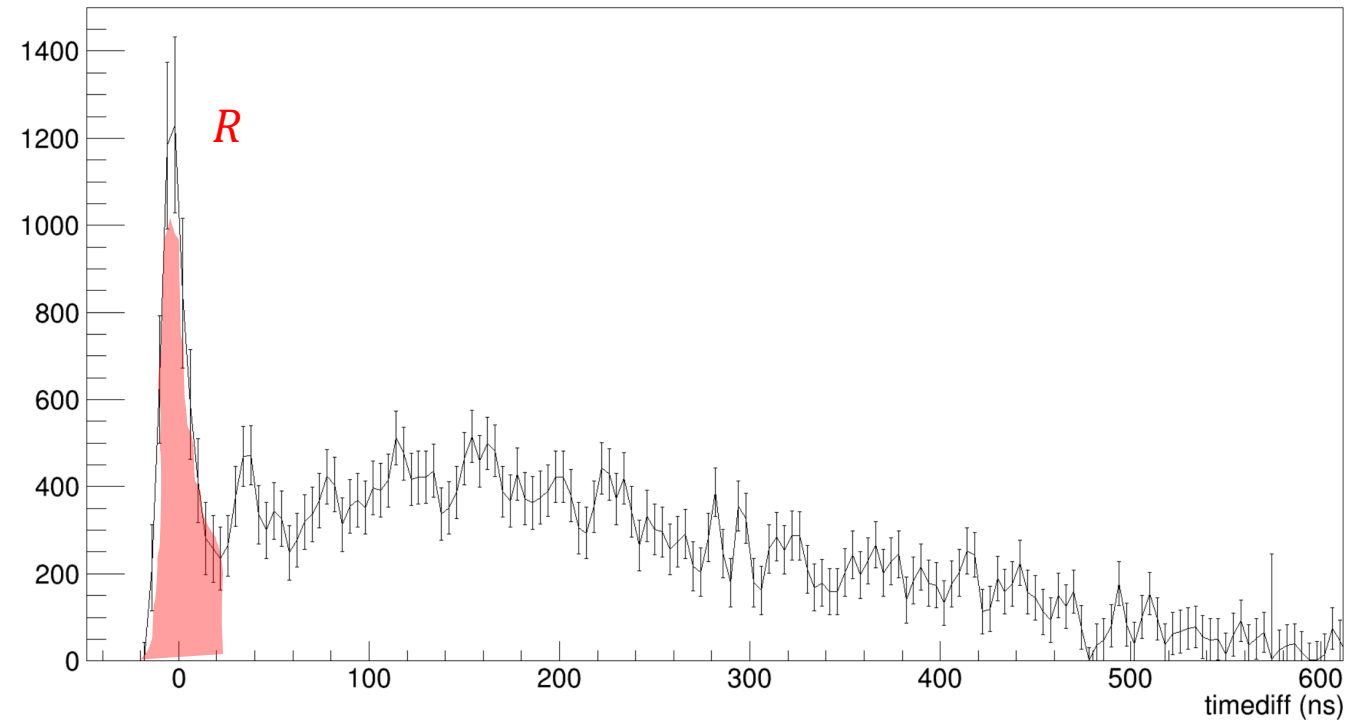
Time cut systematic

Systematic error on ^{40}K extraction

$$\sigma_{sys} = \Delta E \cdot f \cdot R$$

$$R \approx 0.127$$

Effect $\lesssim 1$ eV \rightarrow Ignore



Results

Quantity	Value
2p1s	712.6096(268)[93] keV
$E_{40} - E_{41}$	264(28) eV
$E_{39} - E_{40}$	69(28) eV
$E_{39} - E_{41}$	335.6(53) eV

Literature errors on 39, 41K

- Absolute error \rightarrow 32 eV; 28 eV
- IS error \rightarrow 24 eV

