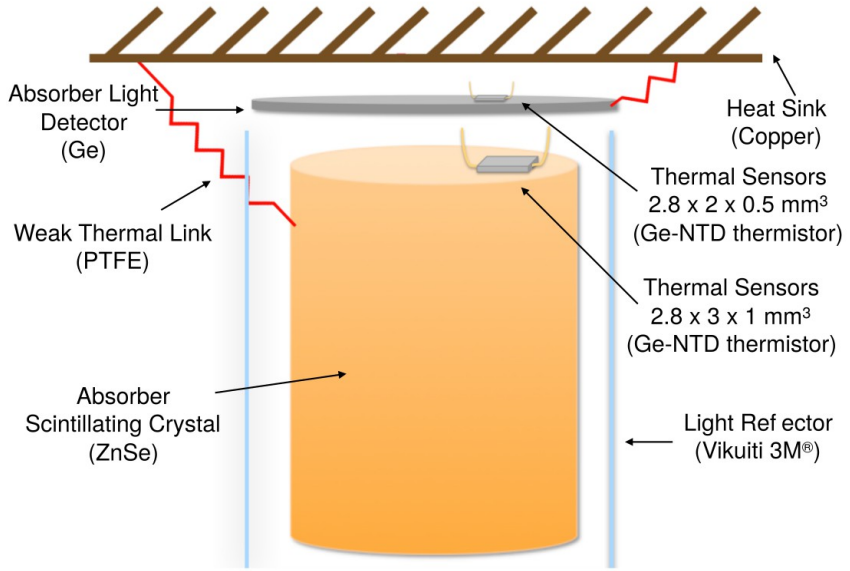
CUPID-0: 0νββ in ^{82}Se



Scintillating calorimeter

Particle interaction → **Heat signal** (Energy)

Particle interaction → **Light signal** (β/γ or α?)

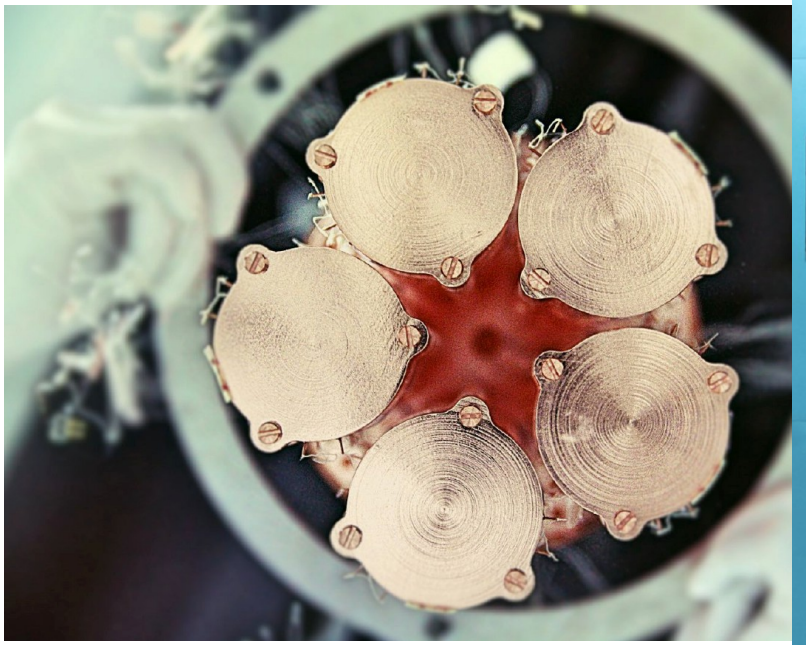
CUPID-0: first kg-scale CUPID demonstrator

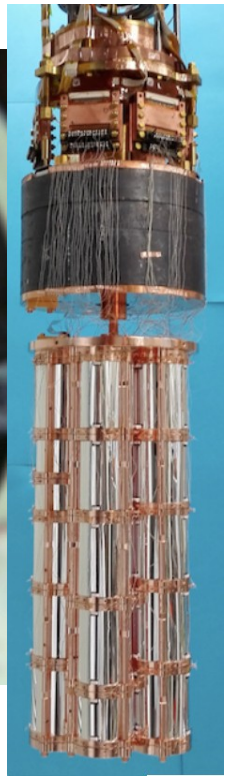
>80% — 95% enriched

$$T_{1/2}^{0\nu}(n_\sigma) \propto \frac{1}{n_\sigma}\frac{\epsilon \cdot i.a.}{A}\sqrt{\frac{M \cdot t}{b \cdot \Delta E}}$$

α tagging, delayed coincidences

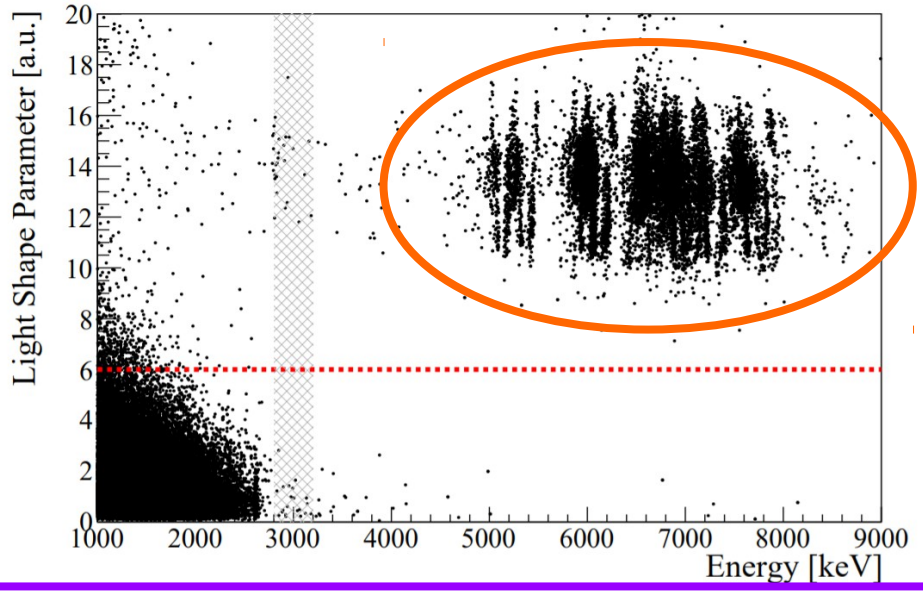
<1% @ $Q_{\beta\beta}$



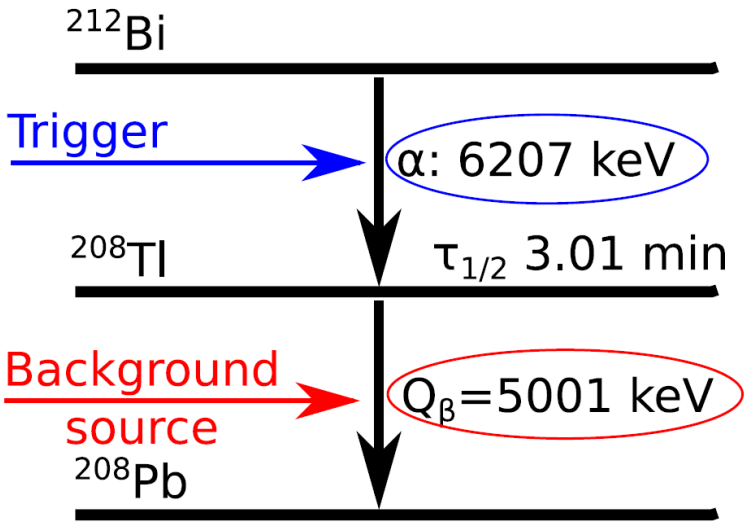


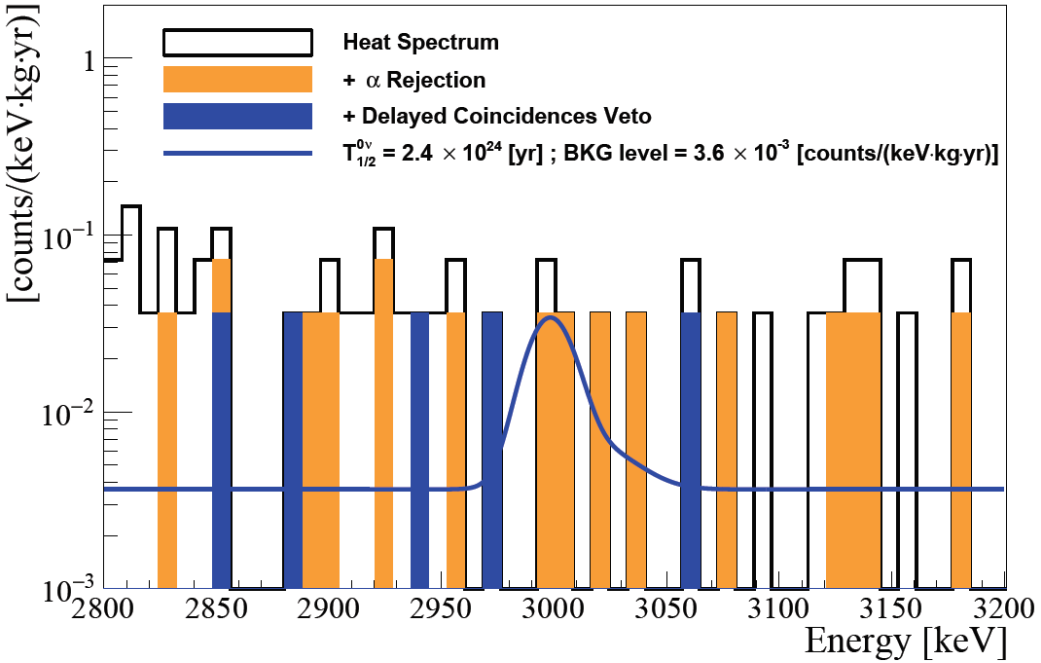
Background reduction:

Light Detectors (α rejection)



Delayed coincidences (^{208}Tl)





Lowest background in a bolometric experiment:

$3.6^{+1.9}_{-1.4} \cdot 10^{-3}$ c/(keV·kg·yr)

Best current limit on ^{82}Se 0νββ half-life:

$$T^{0\nu}_{1/2} > 2.4 \cdot 10^{24} \text{ yr } (90\% \text{ C.I.})$$