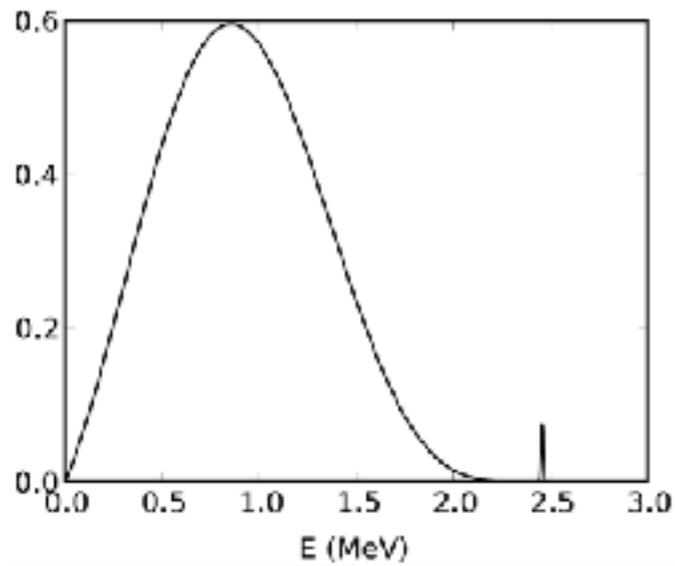


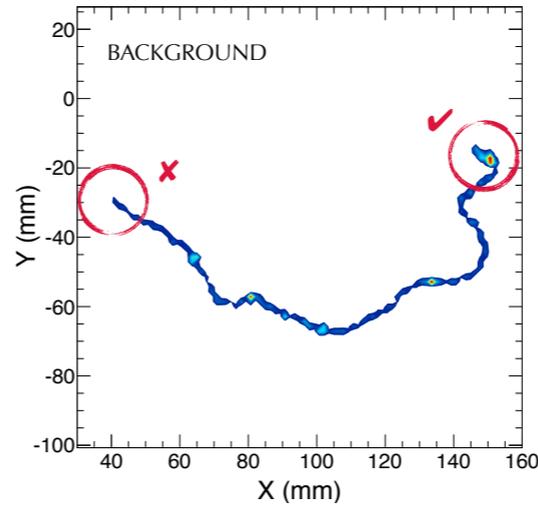
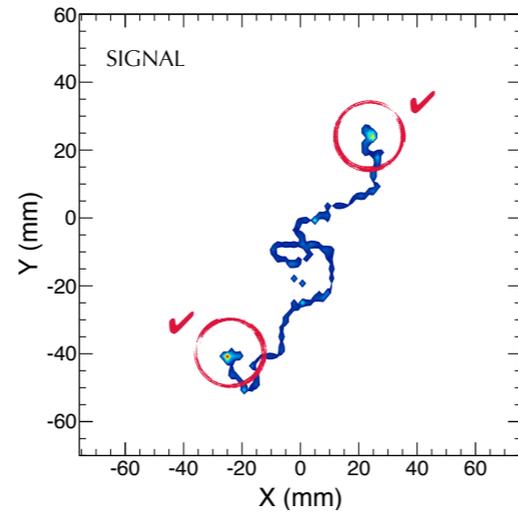
Status of NEXT

March 2018

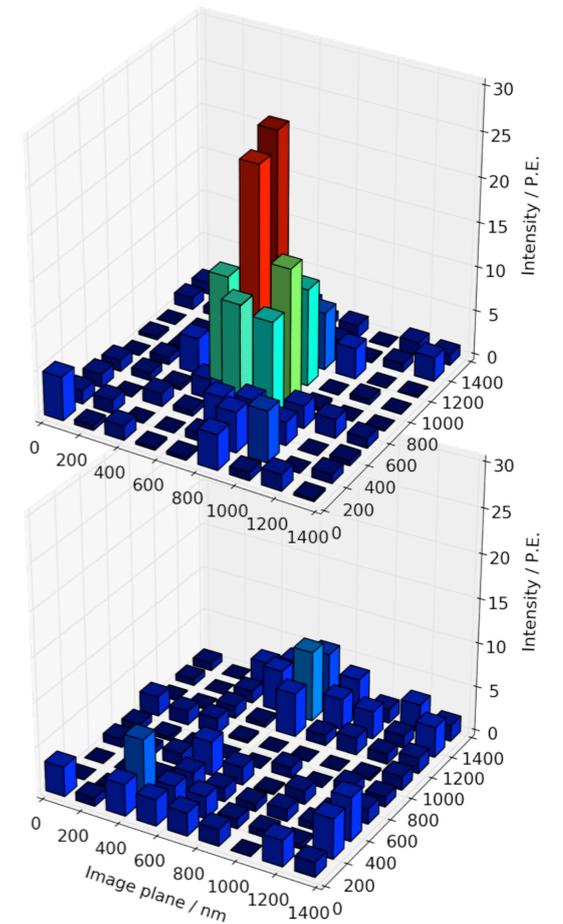
HPXe-EL Technology



Energy Resolution < 1 % FWHM



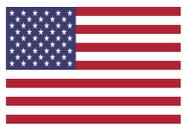
Topological Signature



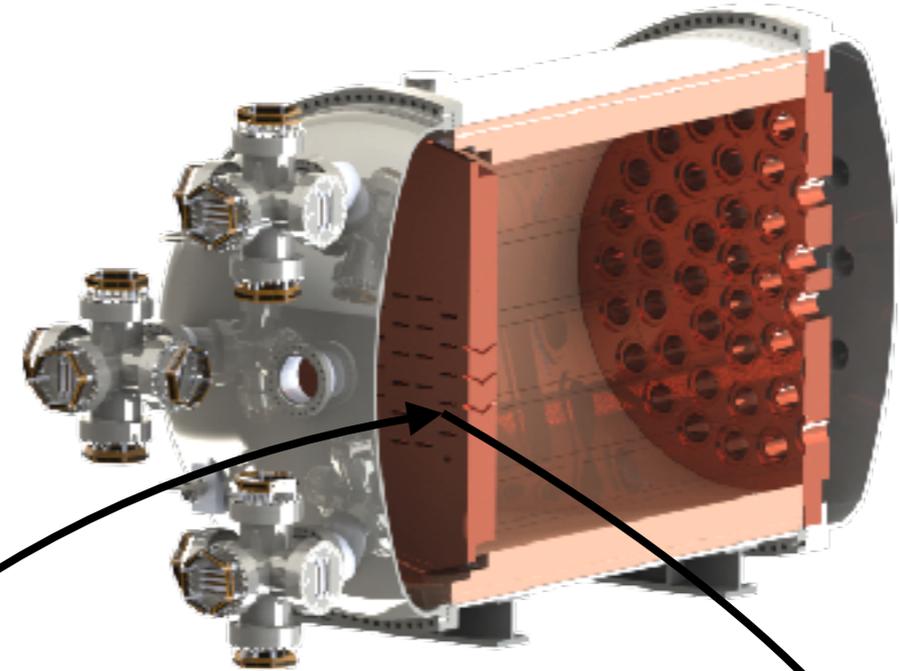
Ba⁺⁺ tagging

First target: To demonstrate background free at 100 kg scale

Ultimate target: To develop a technology “background free” at ton scale

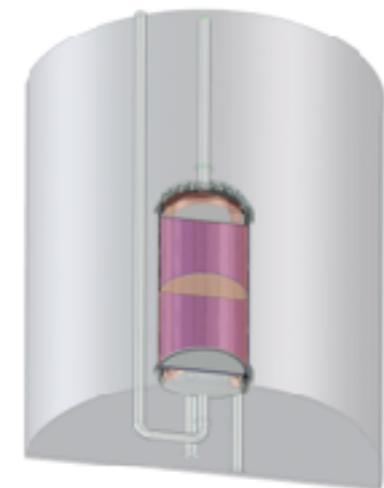


NEXT-100 (~100 kg)
[2019 - 2020's]



$T_0 \sim 10^{26}$ y

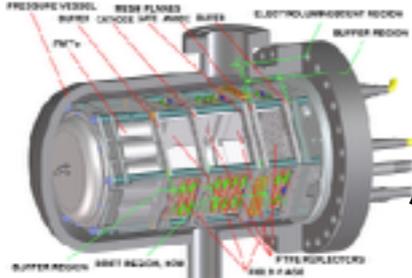
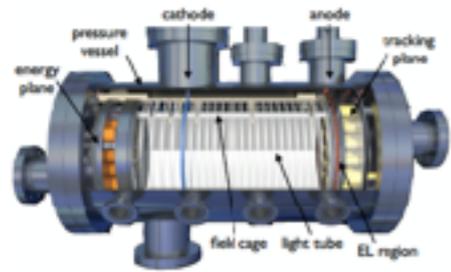
NEXT-ton (~1000 kg)
[2022 - 2020's]



- Staged
- Multiple modules
- Ba++ tagging

$T_0 \sim 10^{27} (10^{28})$ y

NEXT phases



Prototypes (~1 kg)
[2009 - 2014]

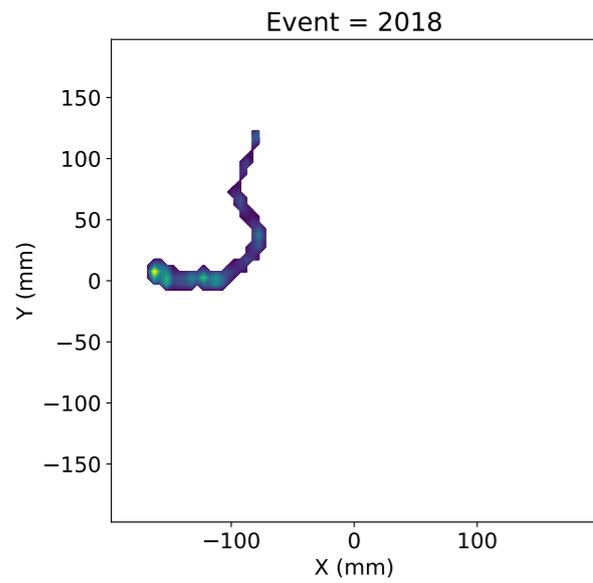
Demonstration of detector concept



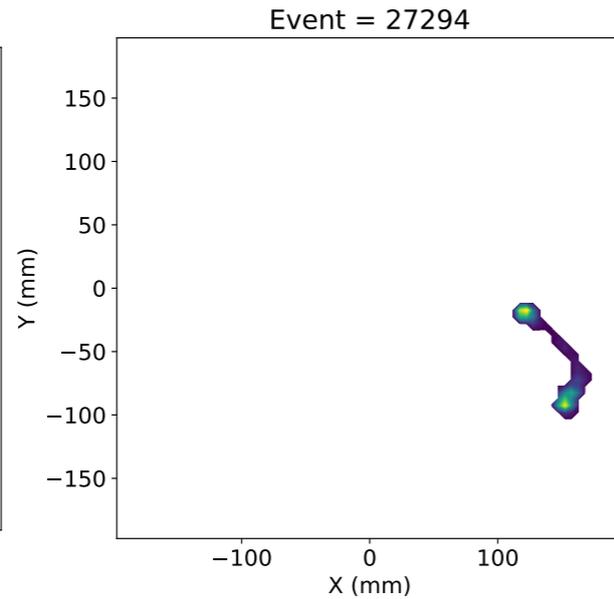
NEXT-NEW (~5 kg)
[2015 - 2018]

Underground and radio-pure operations, background, $\beta\beta 2\nu$

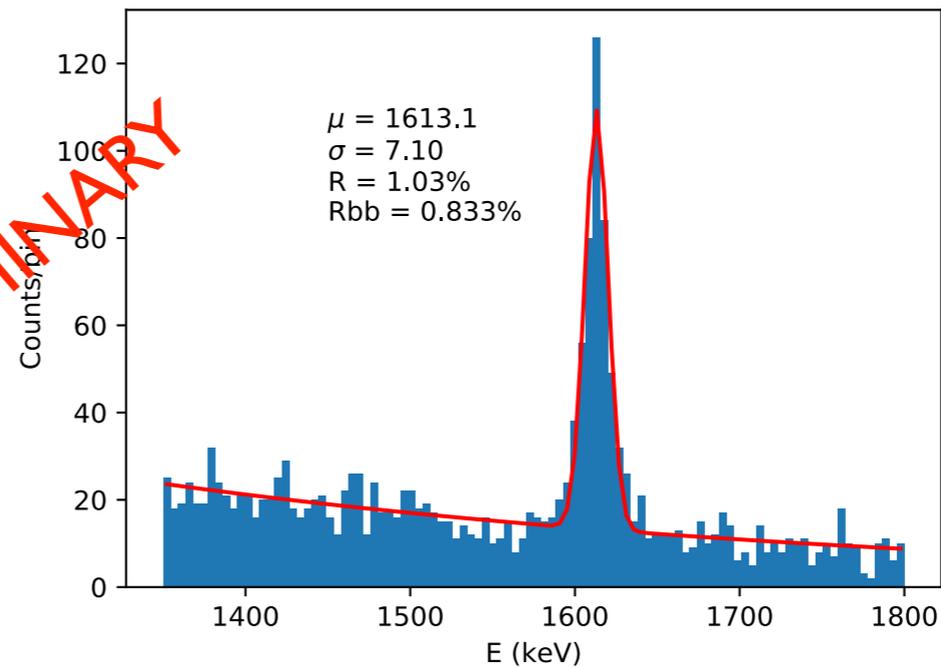
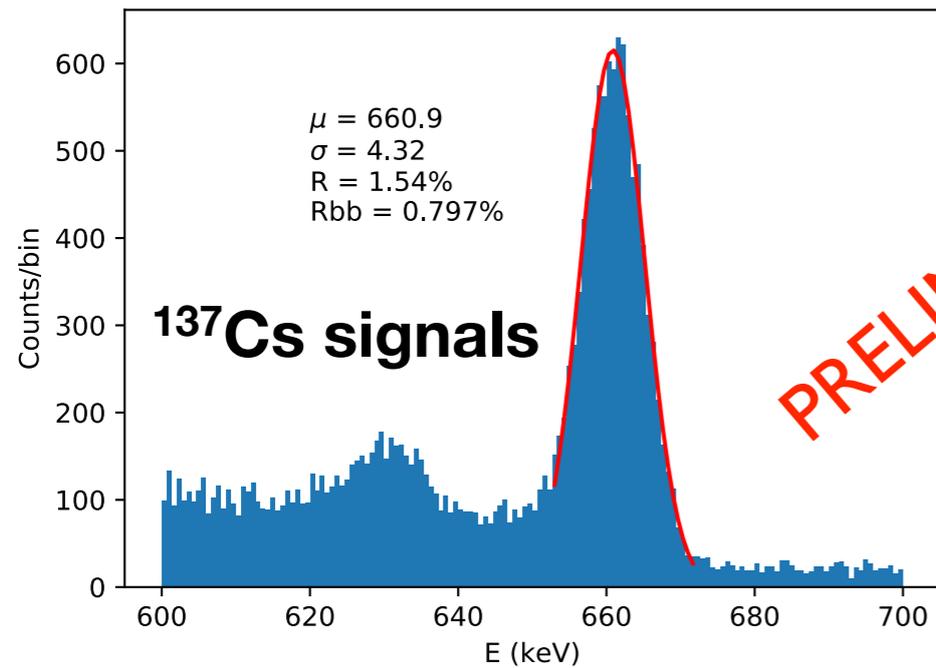
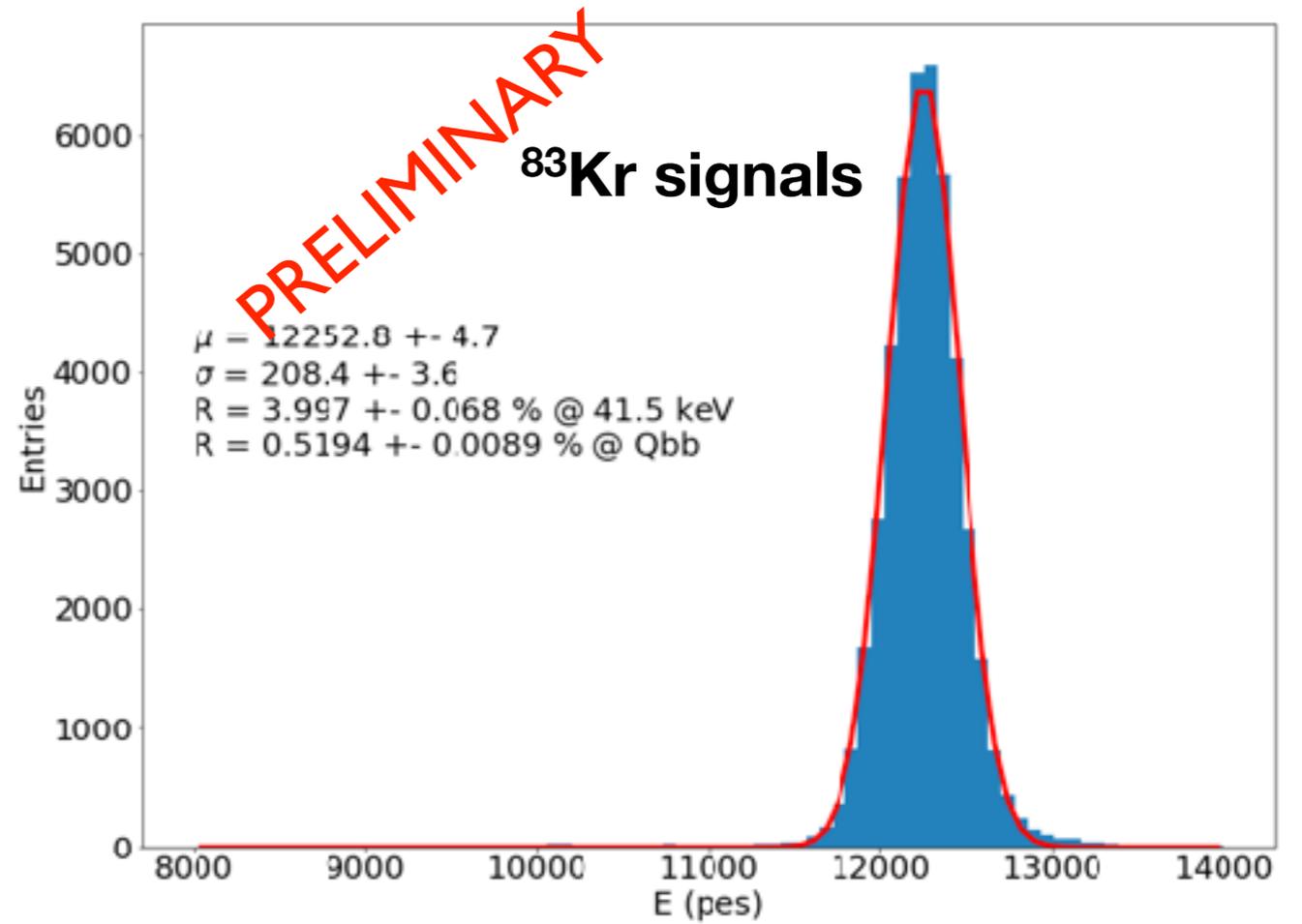
NEW results



Single electrons
(off peak)



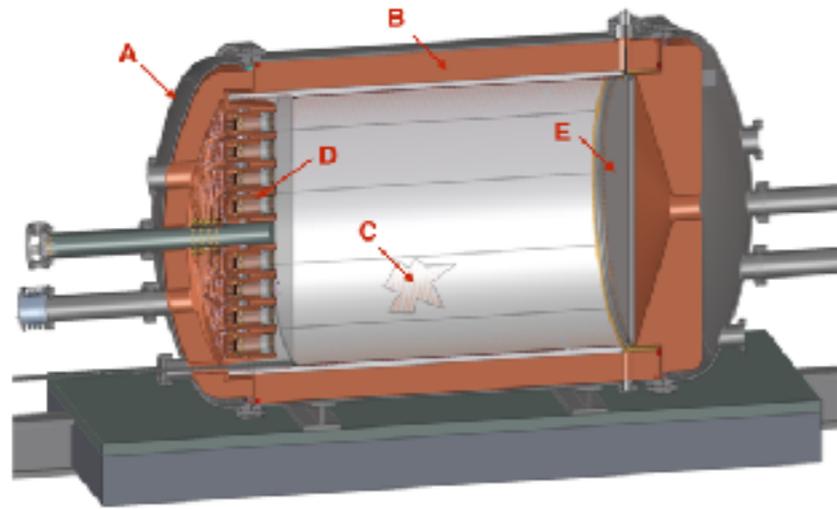
e+e- double escape peak



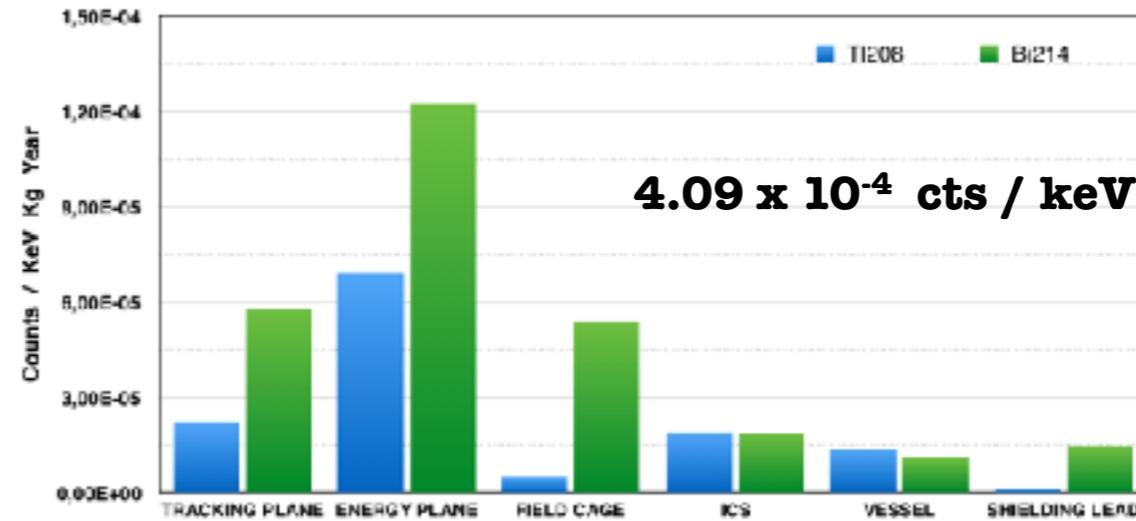
**^{208}Tl double
escape peak**

NEXT-100

Background budget

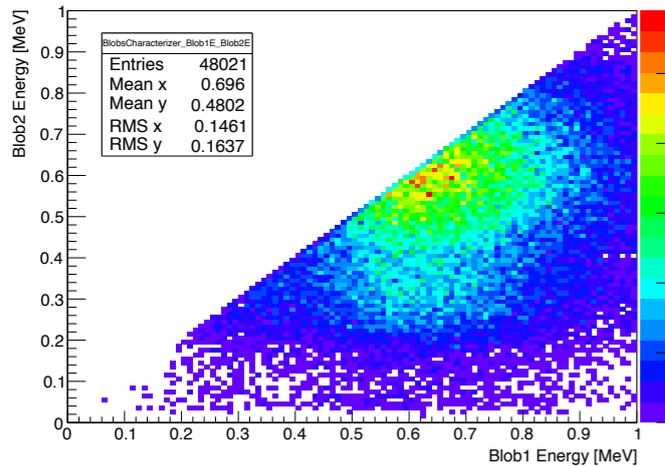


Tl208 & Bi214 contributions from NEXT-100 detector systems

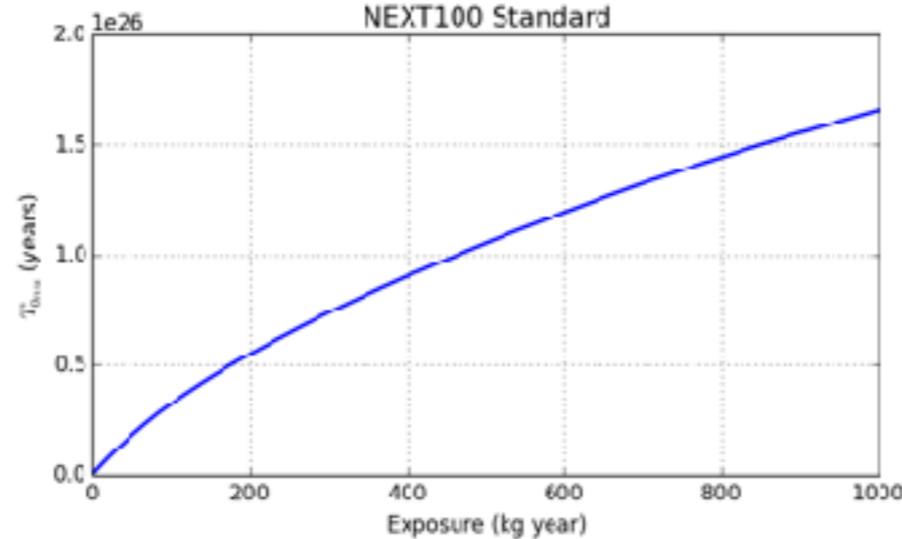


4.09×10^{-4} cts / keV kg year

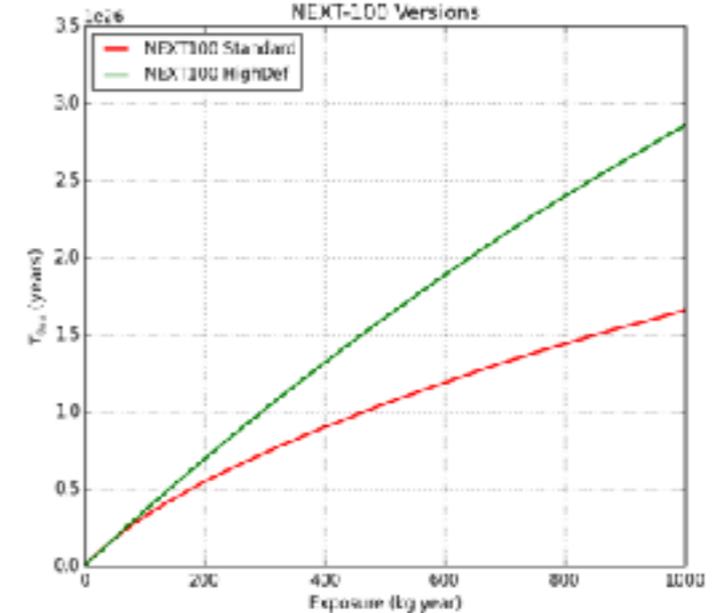
BB0nu



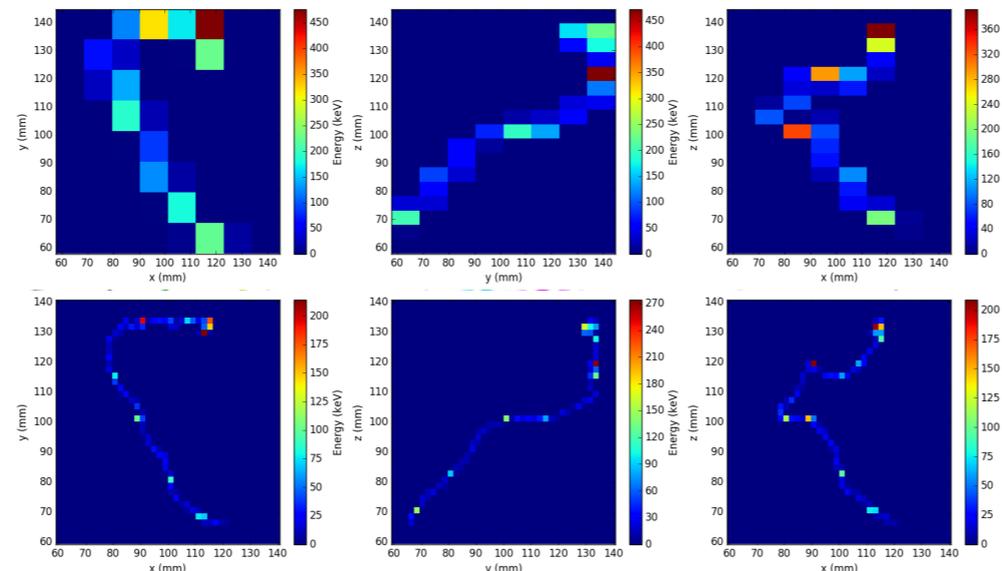
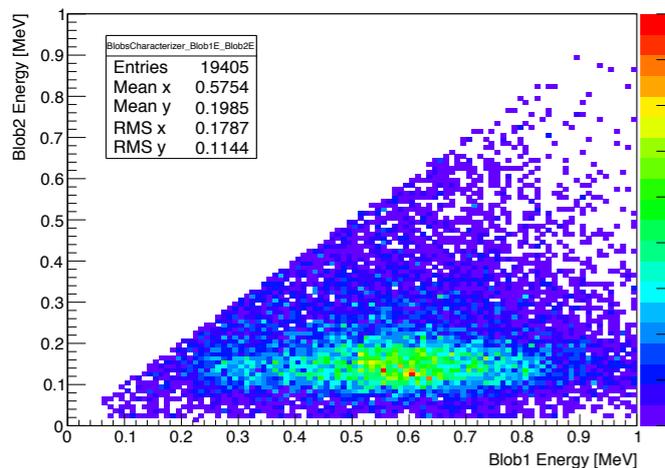
NEXT100 Standard



NEXT-100 Versions



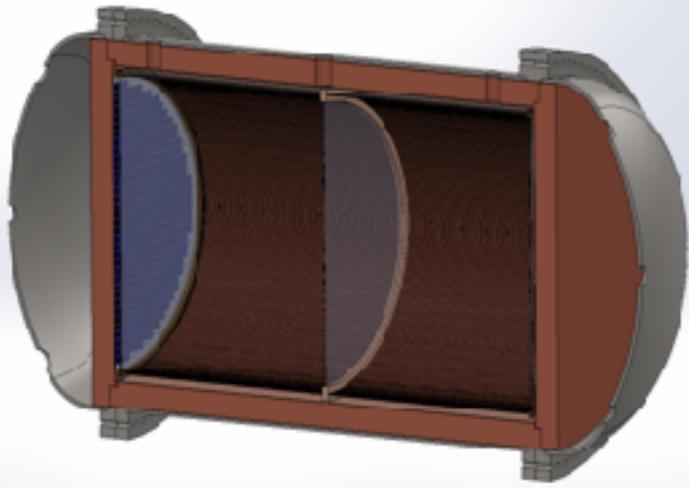
Bi214



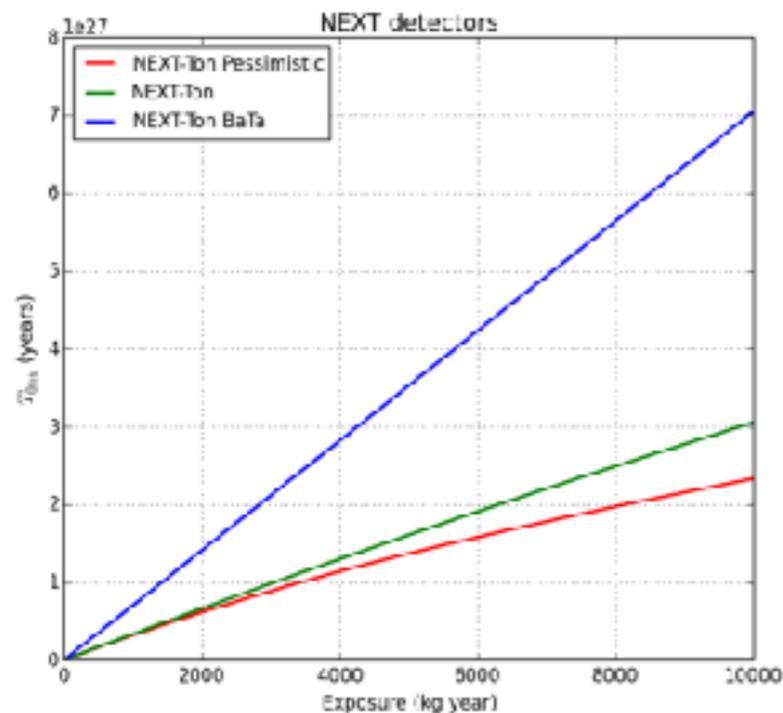
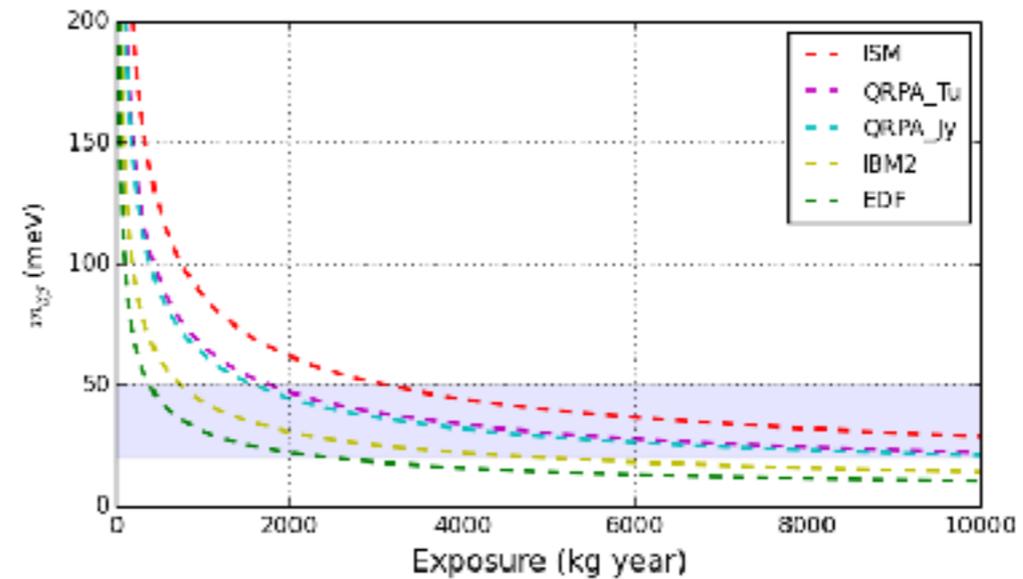
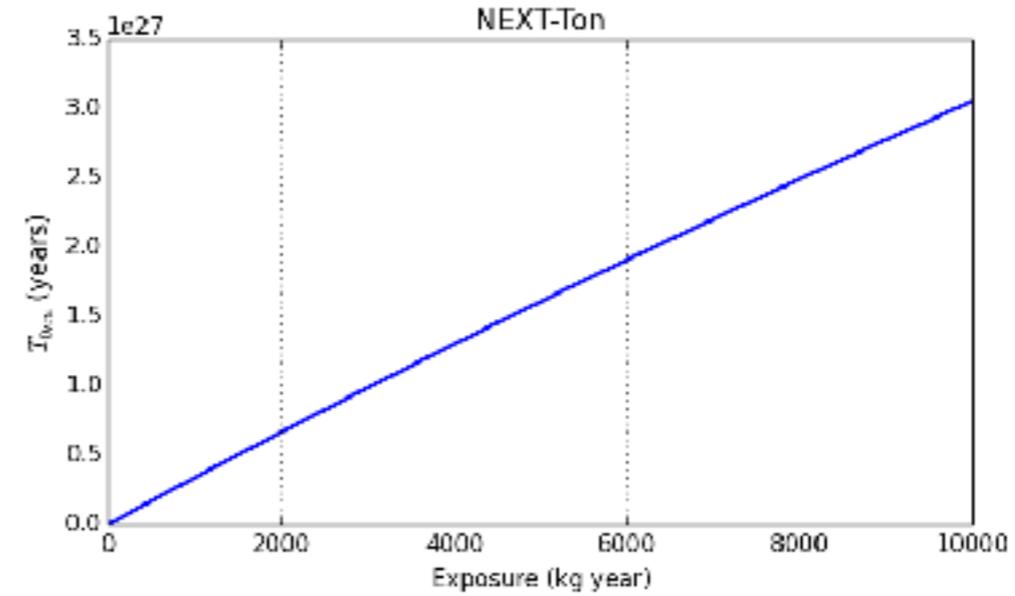
NEXT-100 HD expects a background rate of **0.12 cts / year**

quasi background free
Extrapolation ton scale

NEXT-ton modules



- SiPMs mounted on ultra-low substrates.
- Cool operation (-50 C)
- Symmetric detector(s)
- Several modules



- Ba tagging in HPXe seems a realistic possibility
- Leading to background free ton-scale detectors