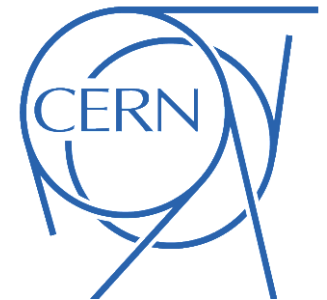# A new detection concept for measuring (n, γ) cross sections with improved sensitivity and resolution

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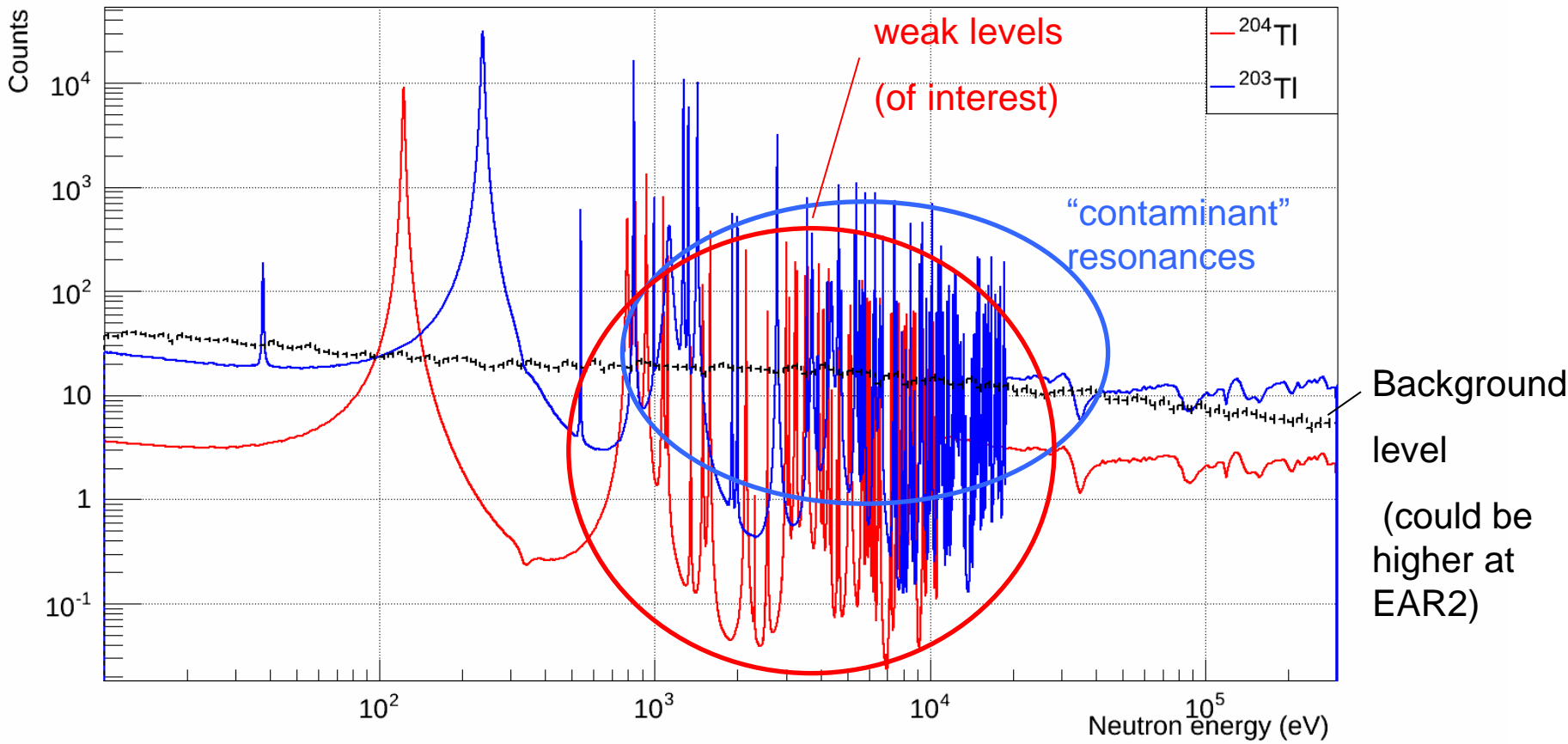(everybody is welcome to join)

A new detection concept for measuring (n, γ) cross sections with improved sensitivity and resolution

- Motivation : the ^{204}Tl(n,γ) case

- Origin of background with C_6D_6 TEDs

- An alternative approach for TEDs with improved peak-to-background ratio

- Preliminary simulations

- Conclusions & Outlook

Motivation: measurements in large background conditions

^{203}Tl(157 mg) & ^{204}Tl(11 mg) @n_TOF-EAR1 (2cm diam., 2e18 prot., ε=0.2)

weak levels (of interest)

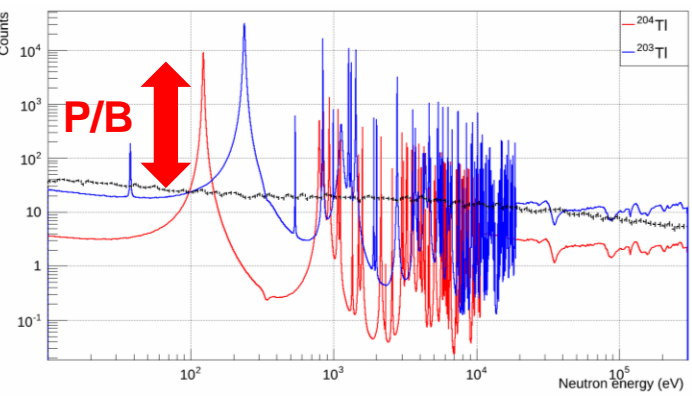"contaminant" resonances

Background level (could be higher at EAR2)

• The measurement of small samples, low CSs or weak resonances is challenged by the peak/background ratio, which depends both on the experimental conditions and on the detection system used.
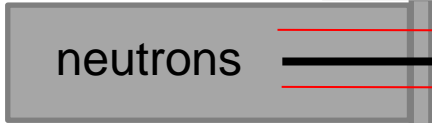
A new detection concept for measuring (n, γ) cross sections with improved sensitivity and resolution

200 m TOF

neutrons

(n,γ)

• *Neutron sensitivity (PMT)*

• Background radiation.

• In-beam gamma-rays bkg.

• **Peak/Bkg Ratio = 1/5 = 0.2**

neutron

γ-ray

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