

Neutron Spectroscopy with a Diamond Telescope Detector

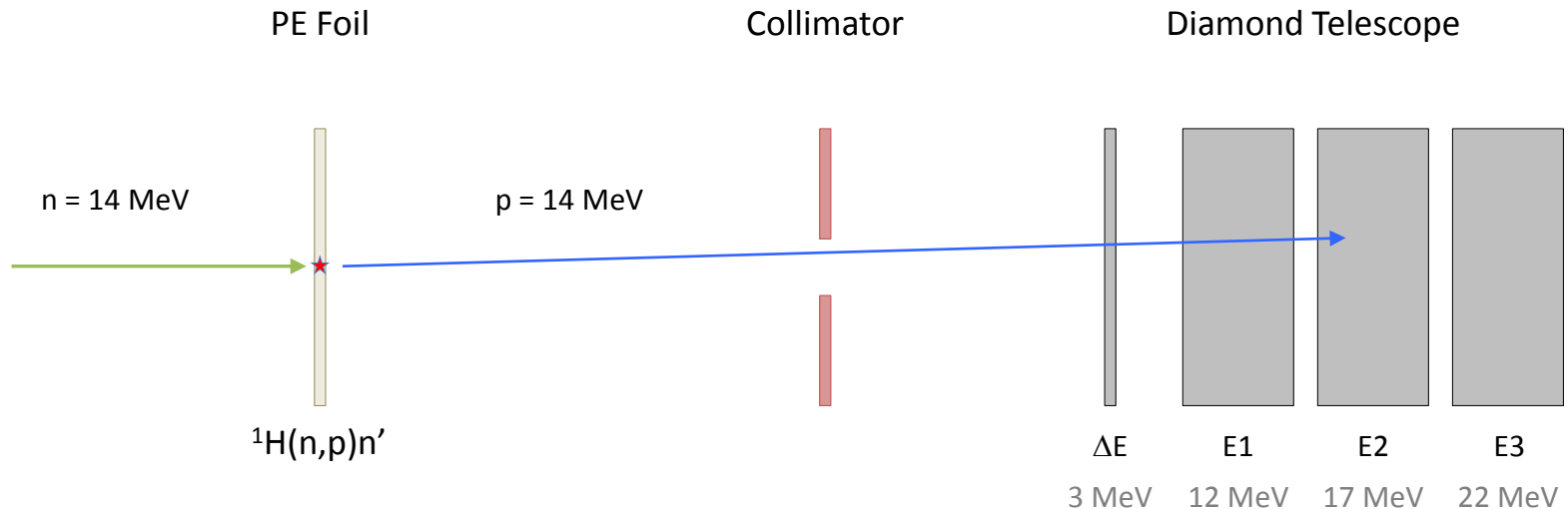
ADAMAS, 13.12.2018

Christina Weiss

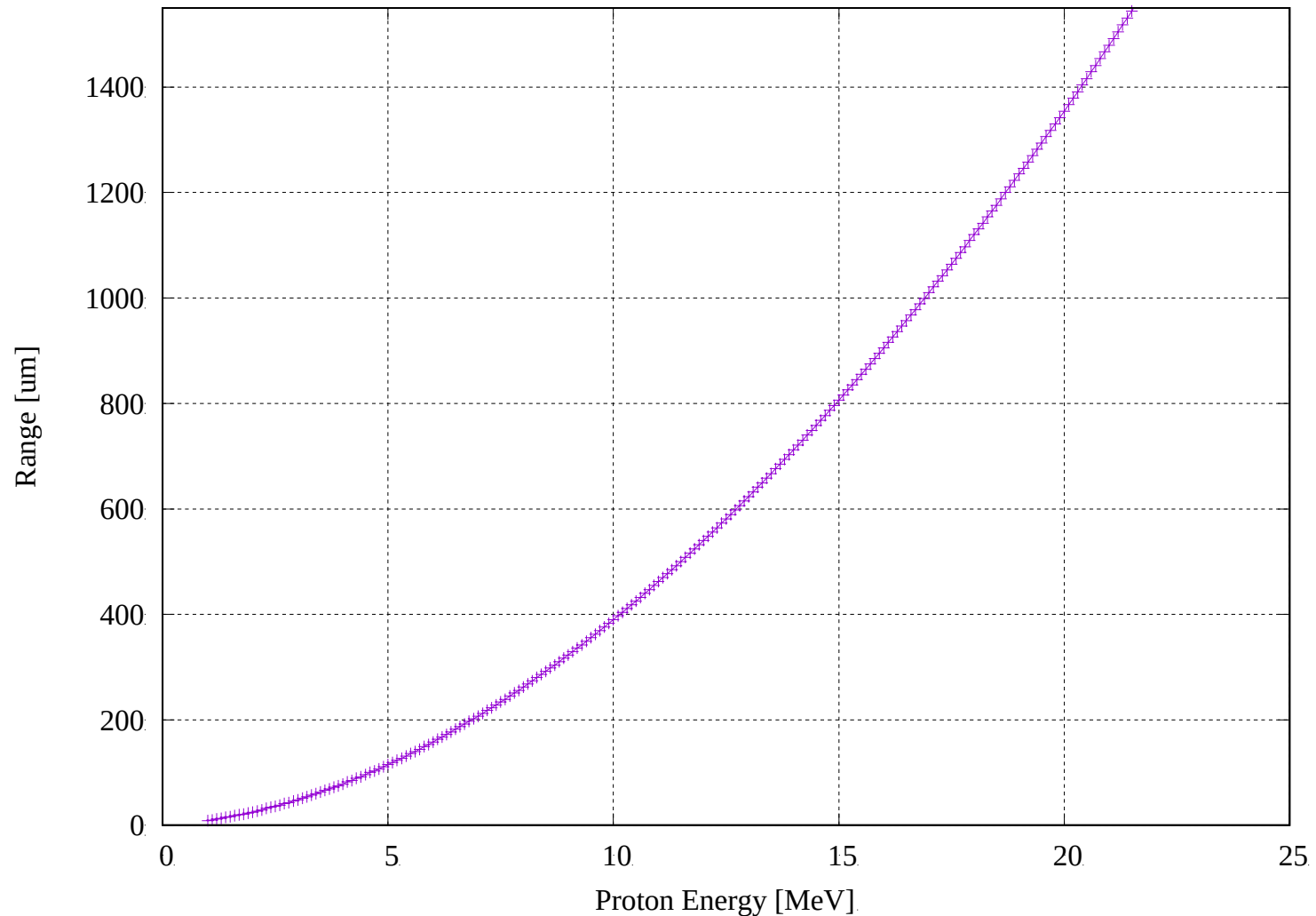
CIVIDEC Instrumentation, TU Wien



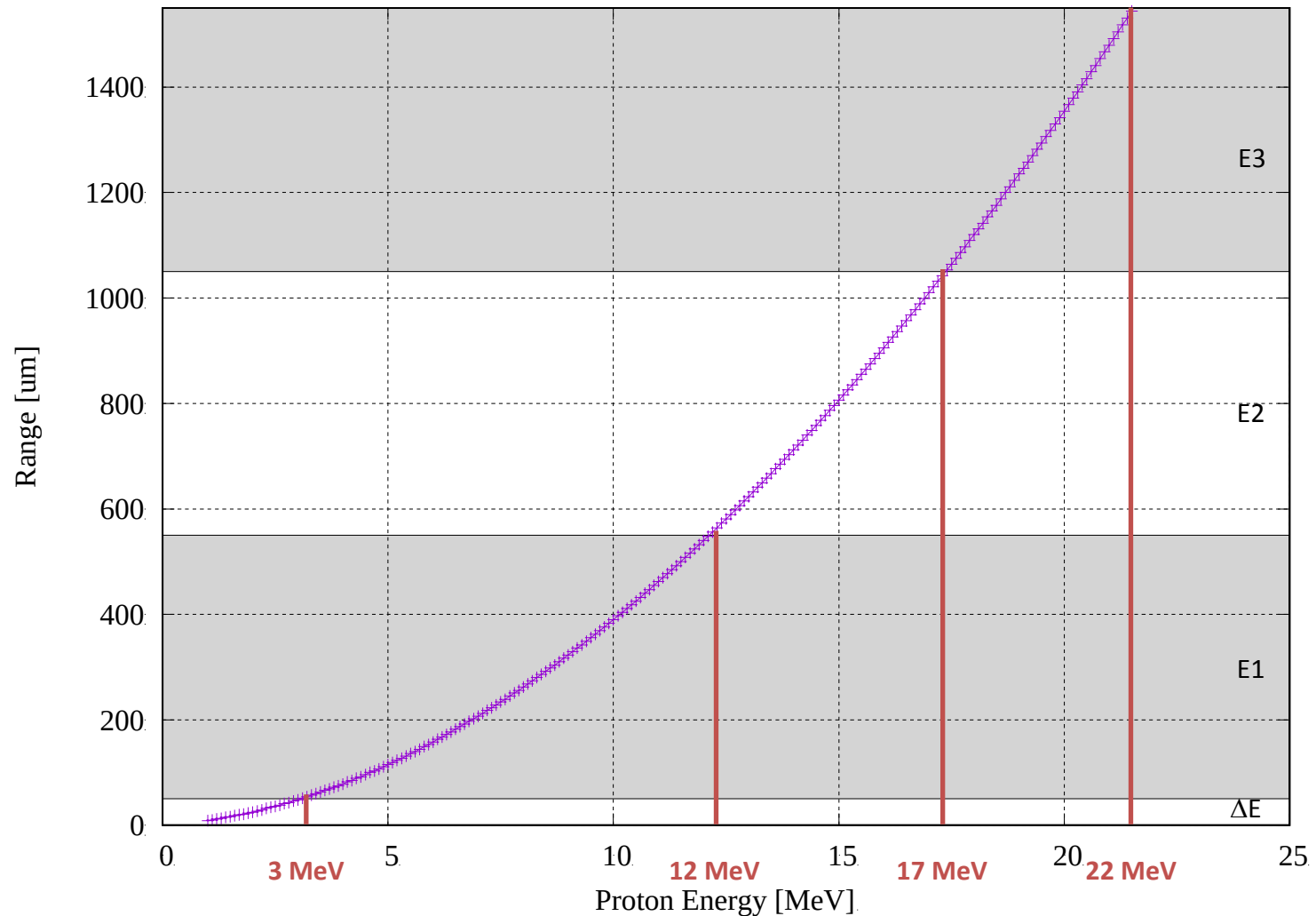
Proton Recoil Telescope Principle



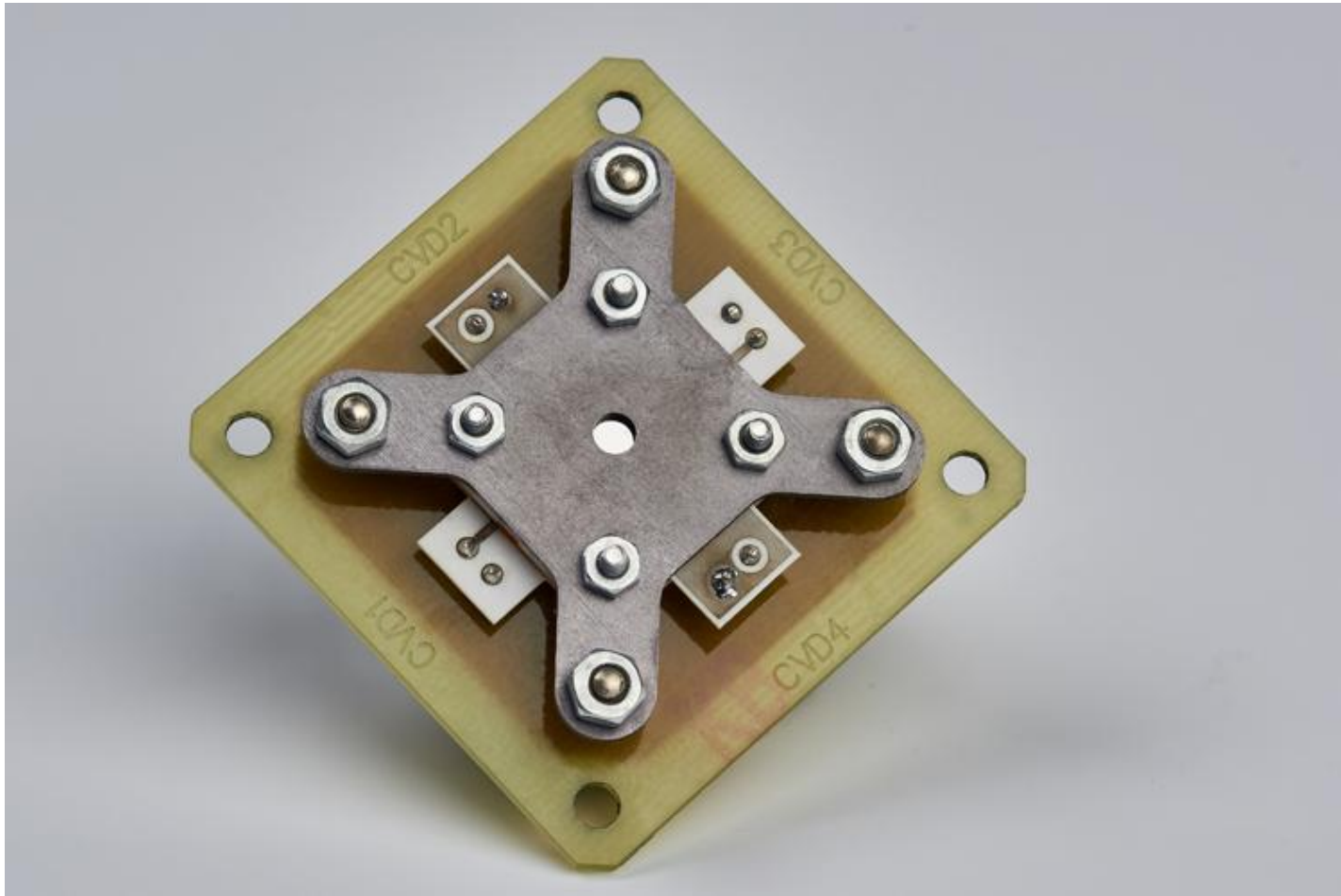
Proton Range in Diamond



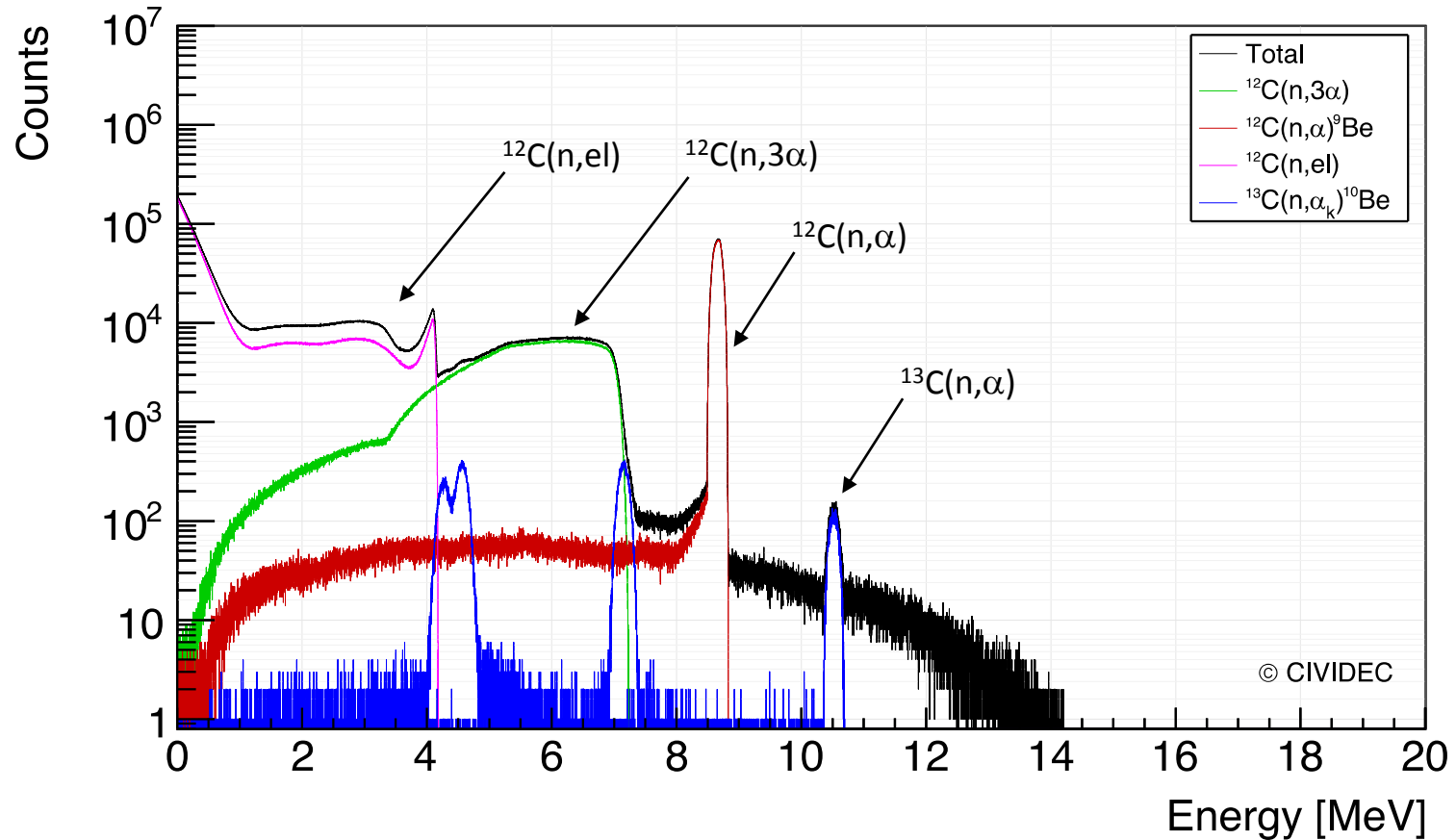
Proton Range in Diamond



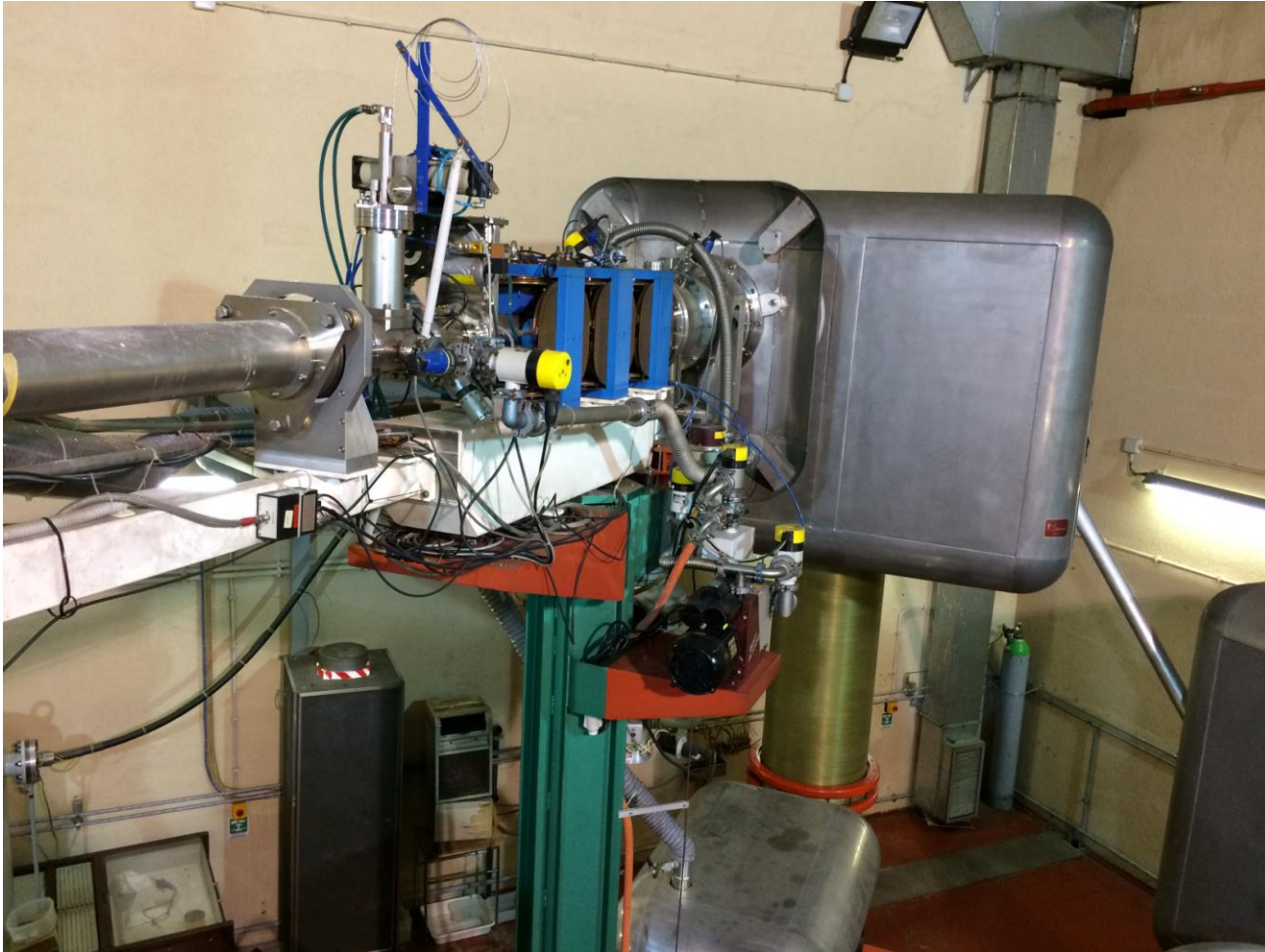
Diamond Telescope Detector



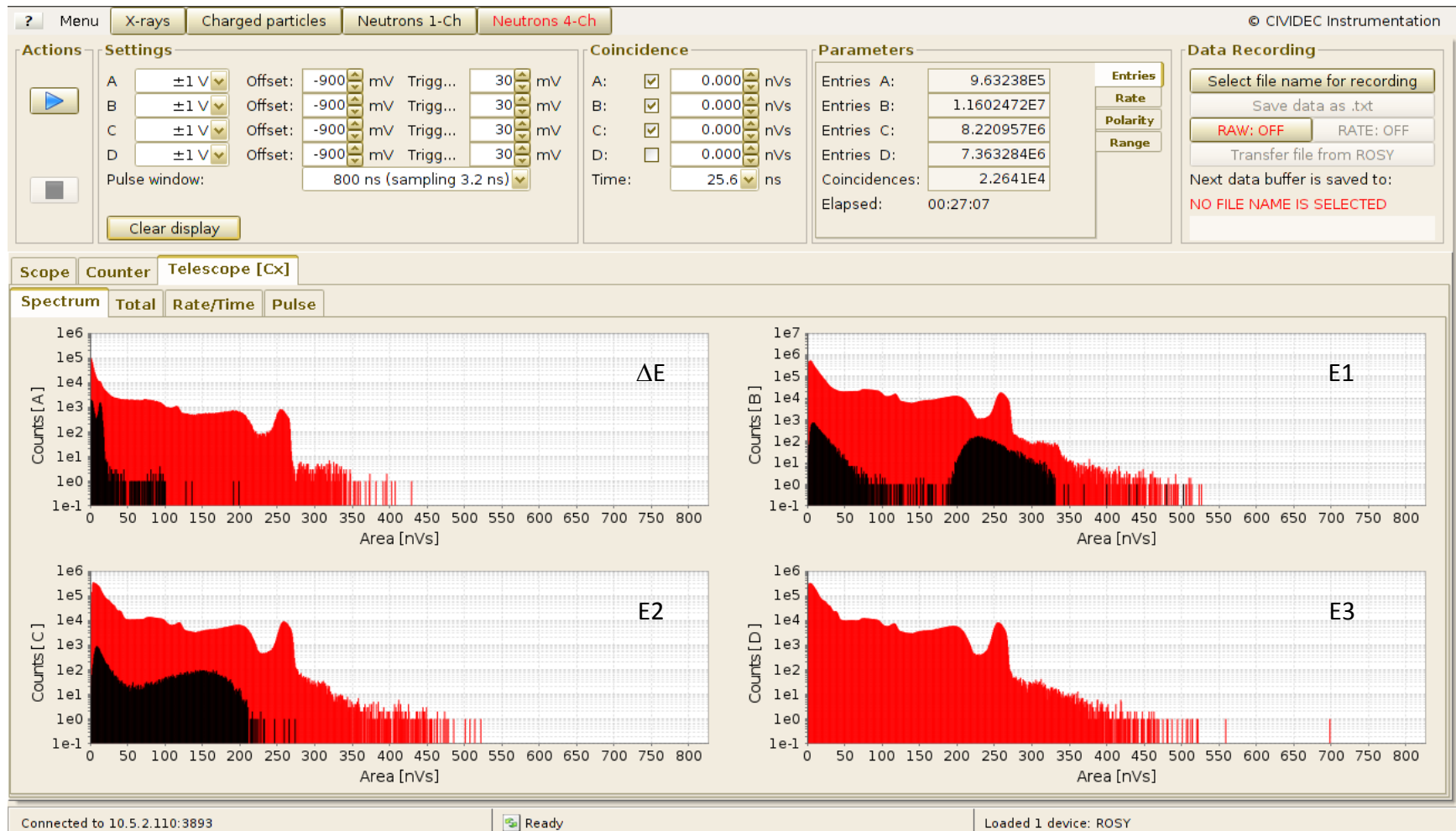
14 MeV simulated Response Function



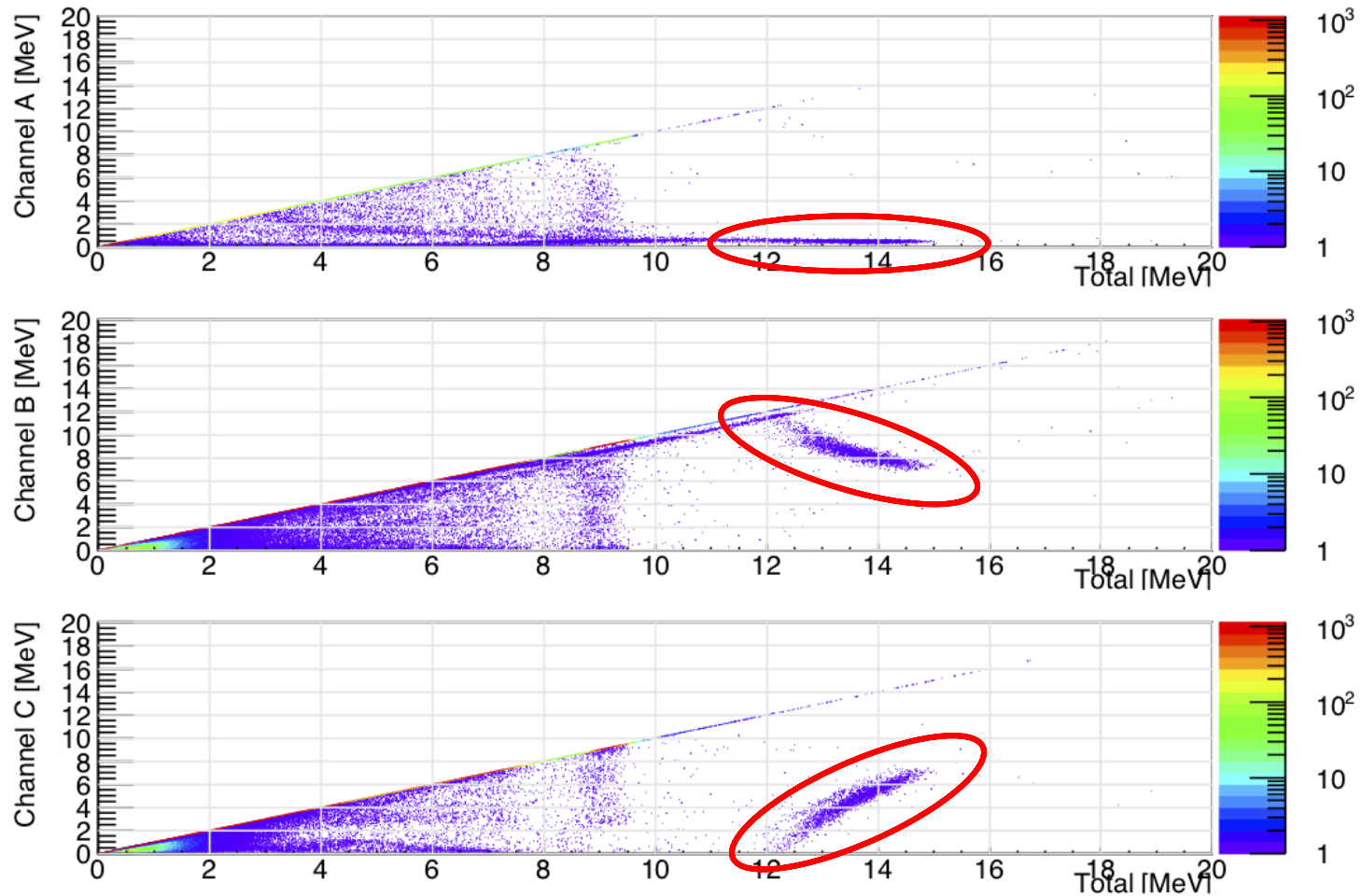
Measurement @ FNG Frascati



Telescope Application

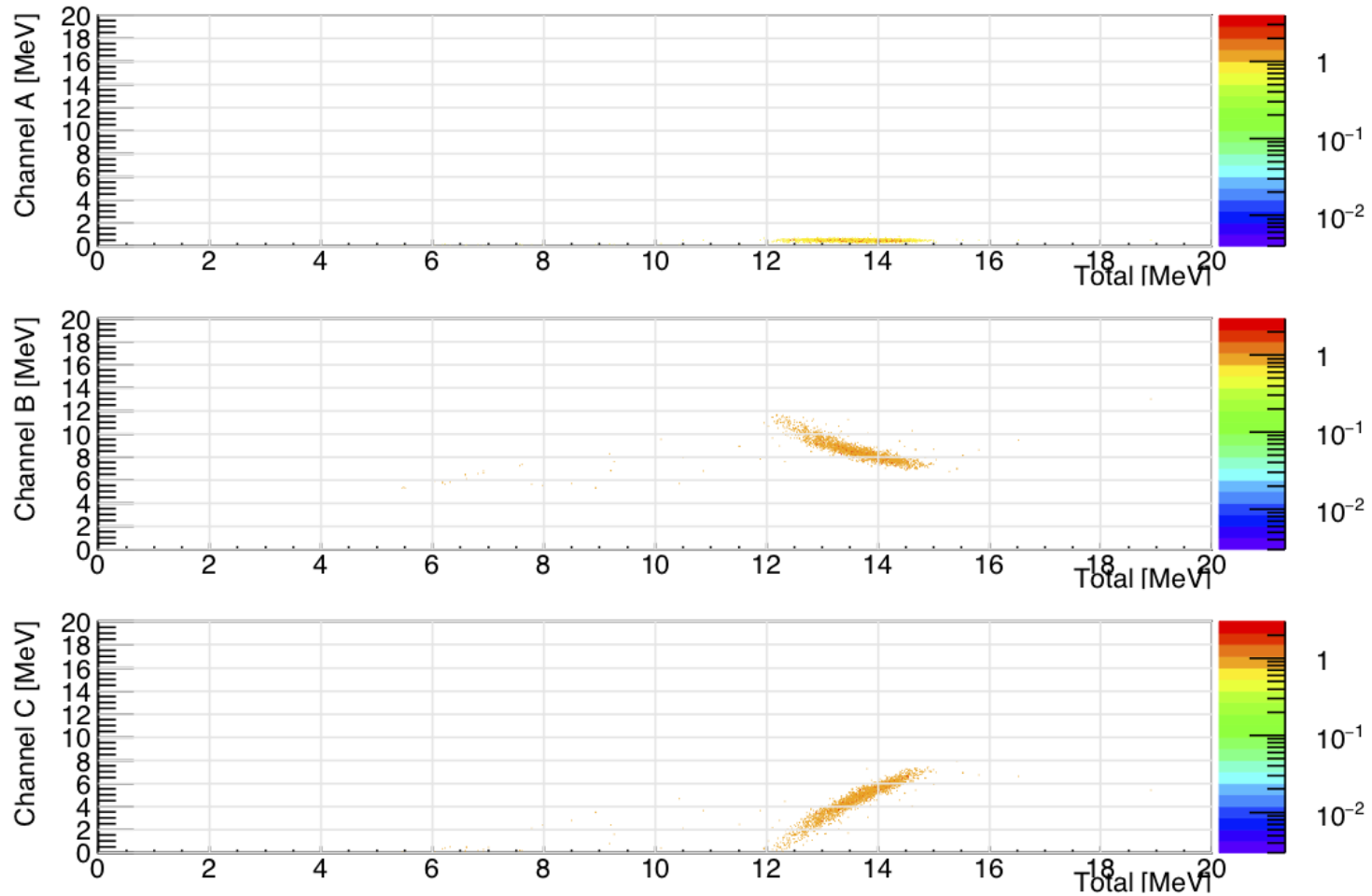


Channels versus Total

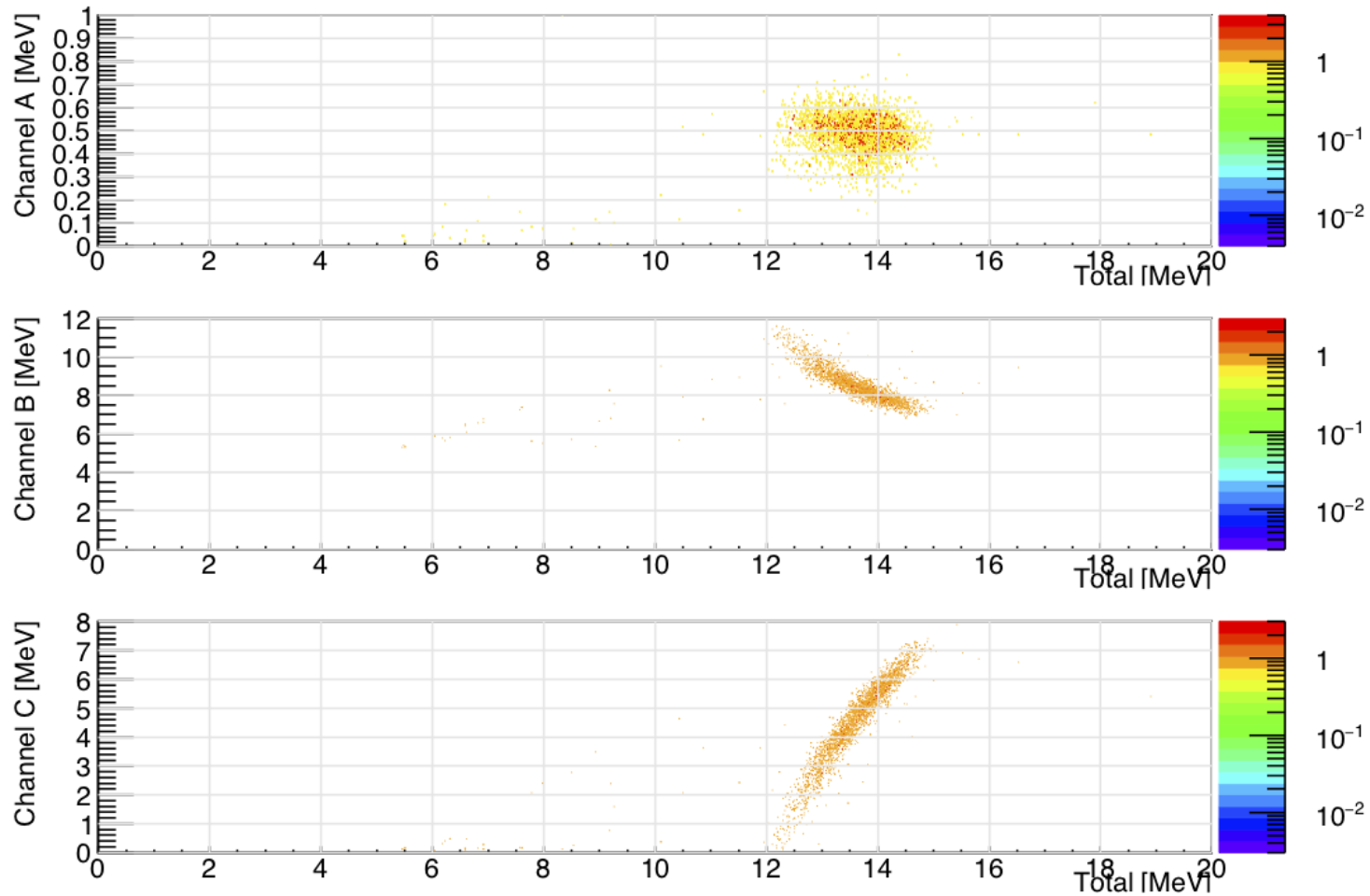


Coincidence = $A + B > 5 \text{ MeV} + C$

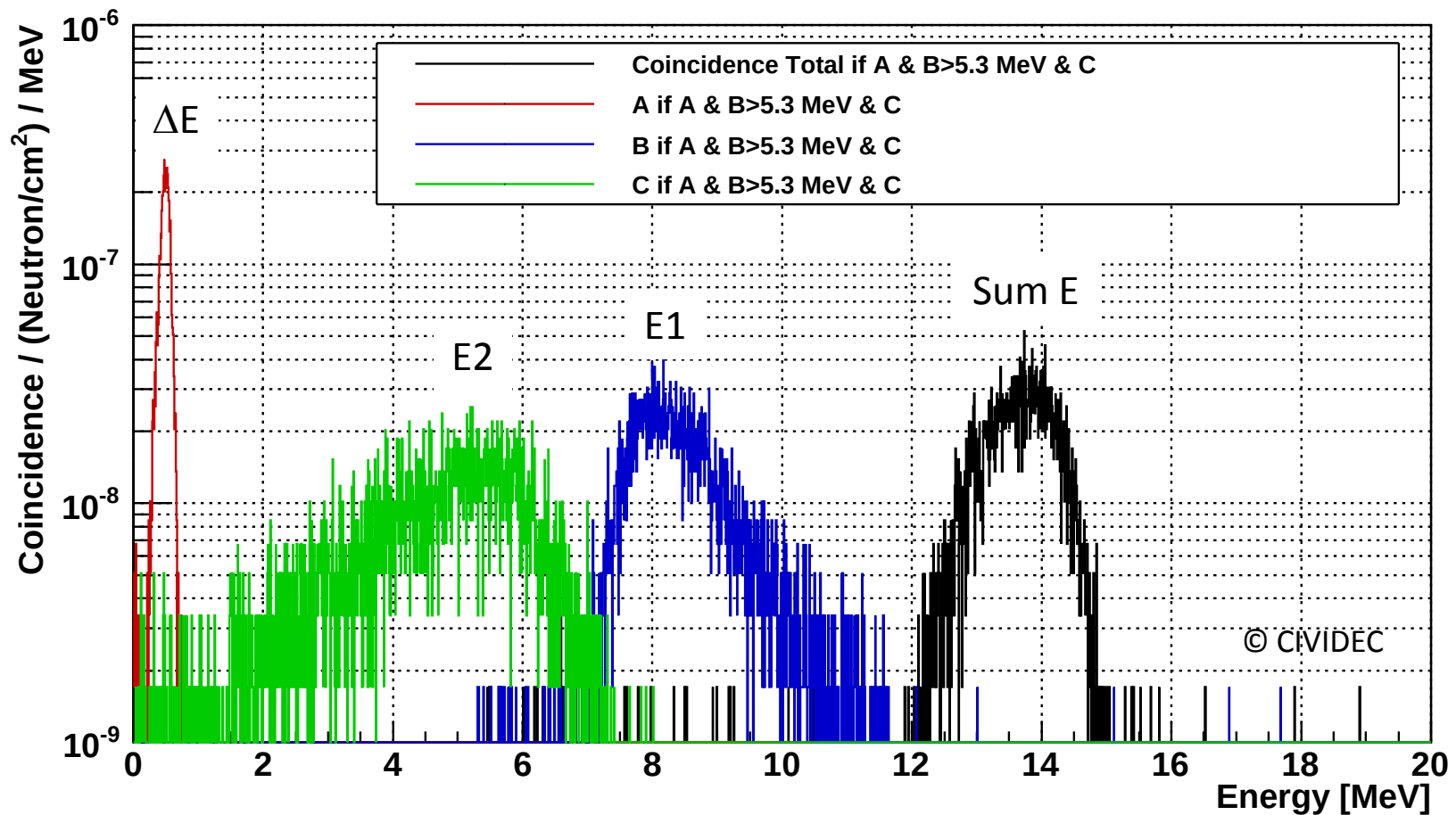
Channels versus Total



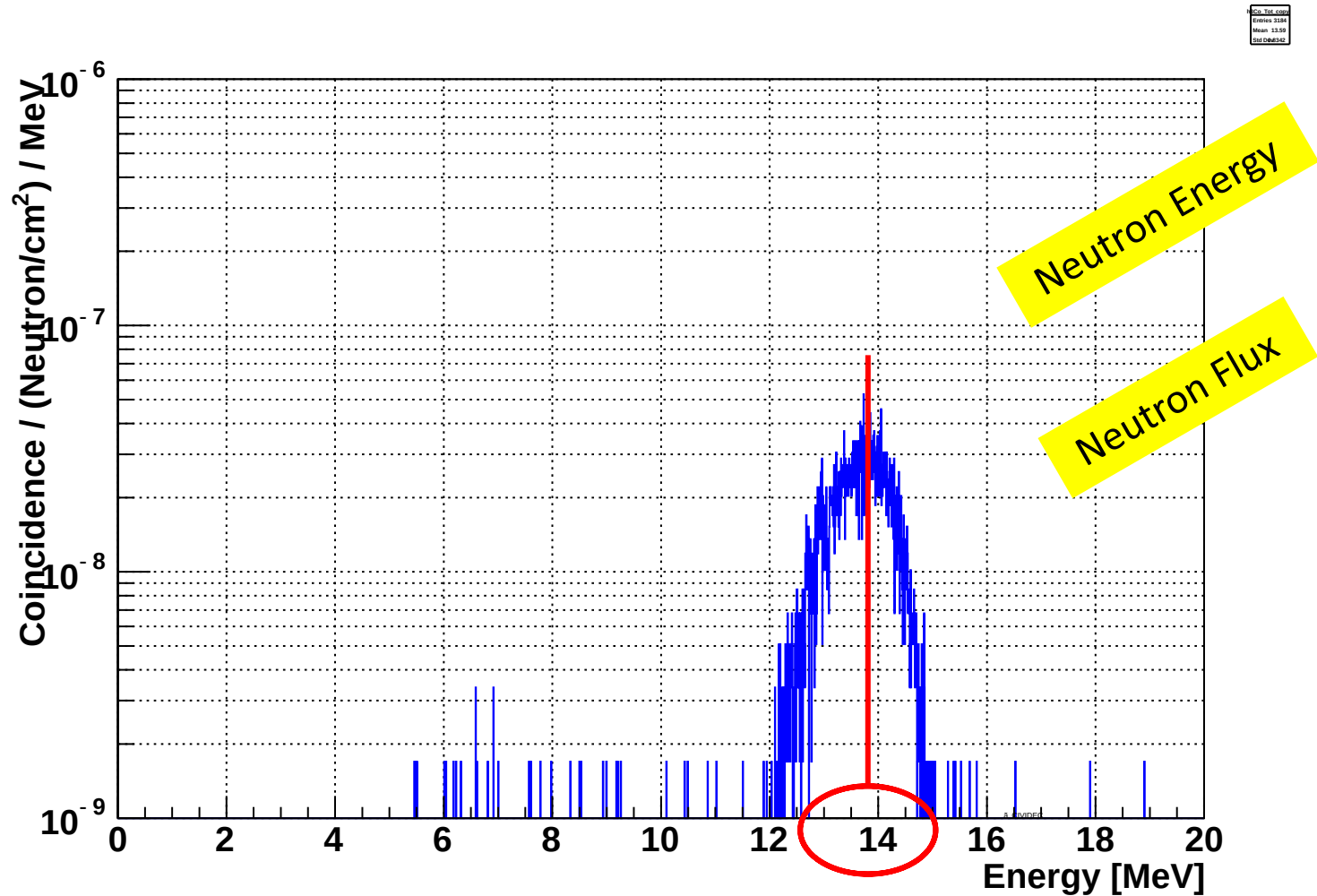
Channels versus Total



Coincidences



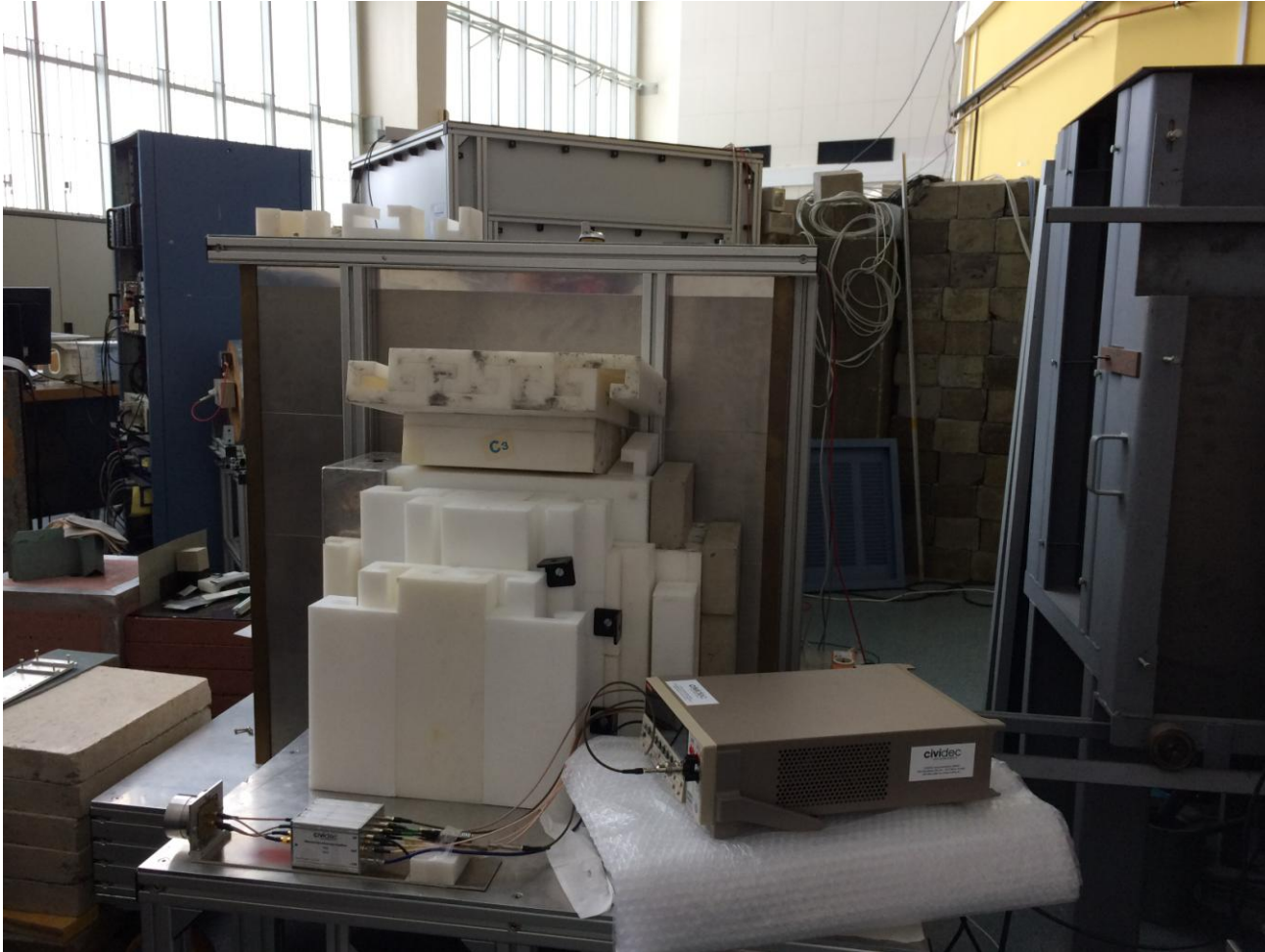
Neutron Spectrum



Continuous neutron spectrum = PuBe source

NEUTRON SPECTROSCOPY

Measurement @ ATI Vienna



PuBe Source

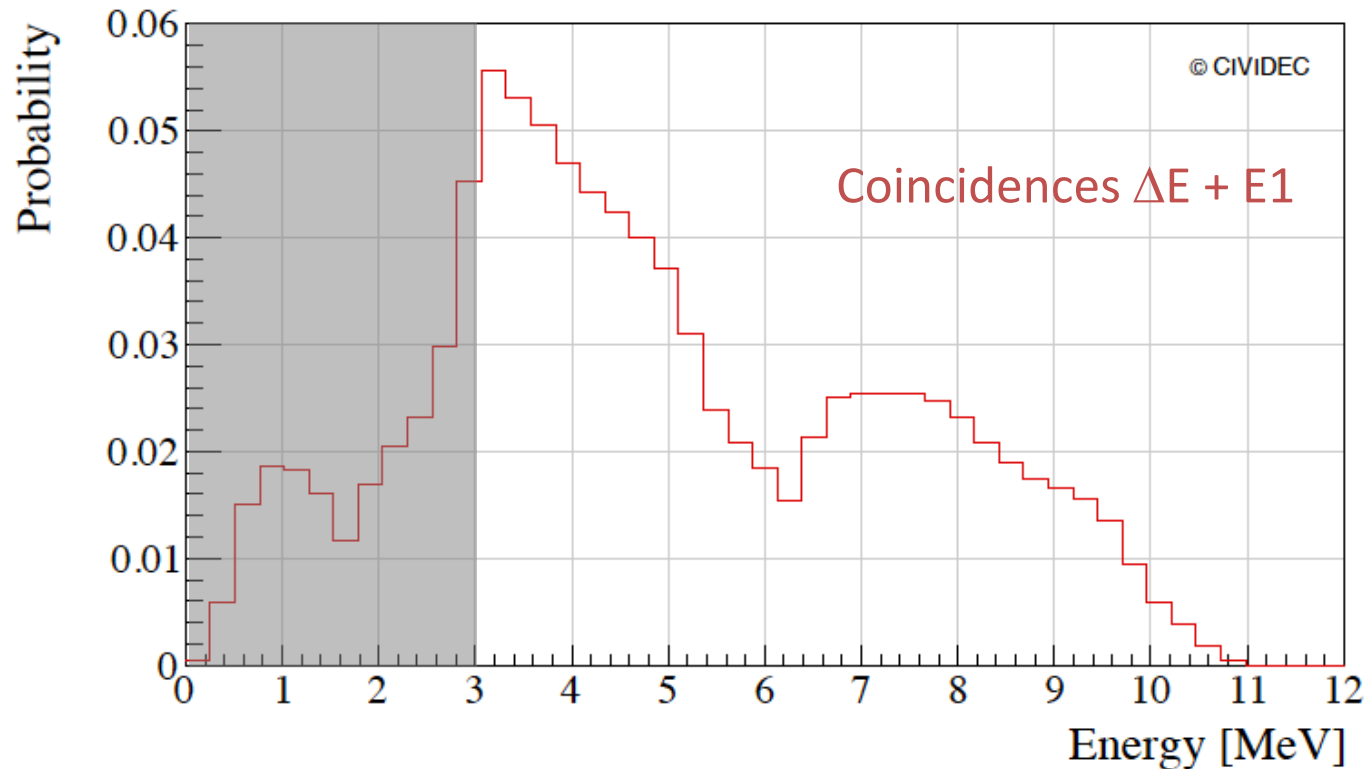
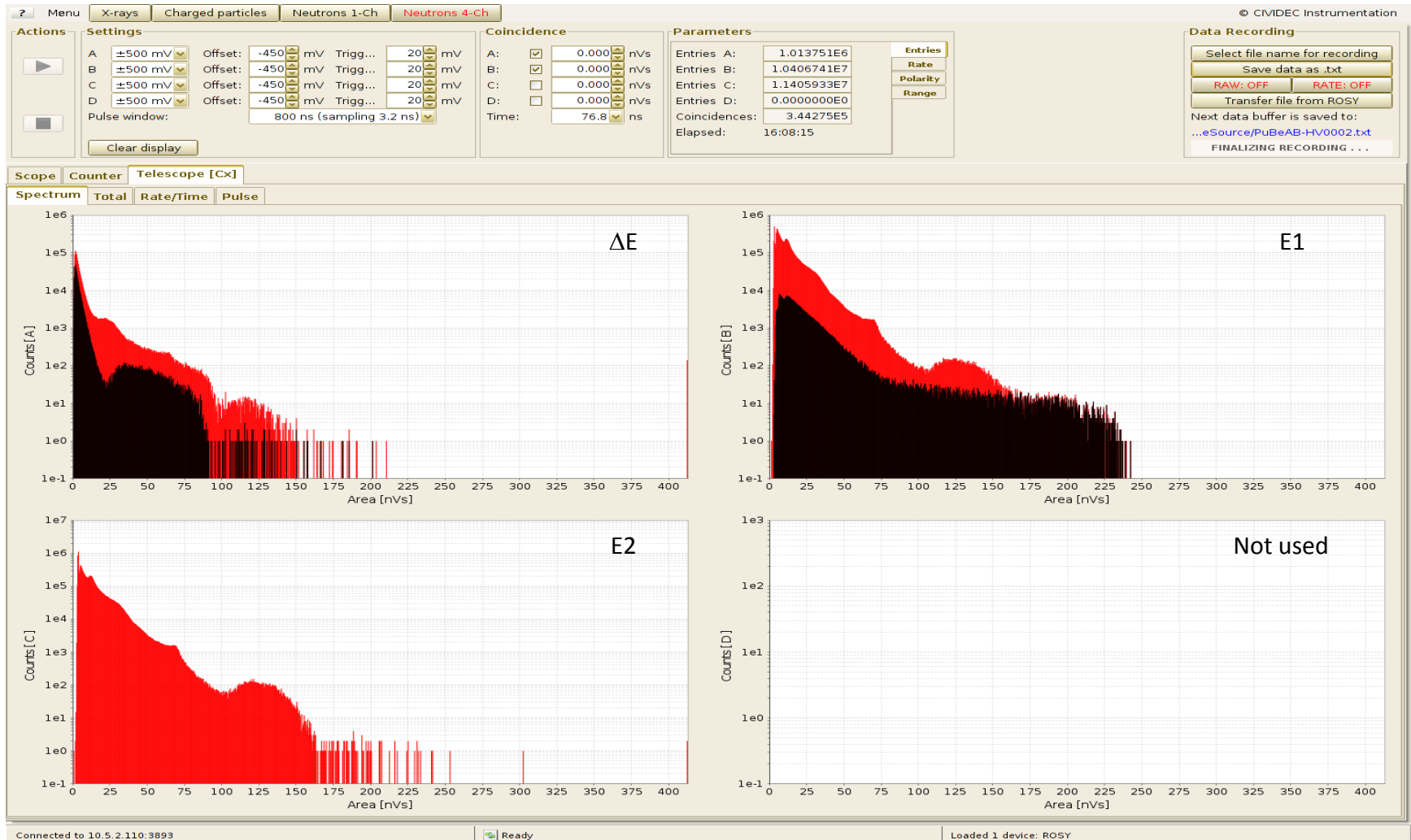
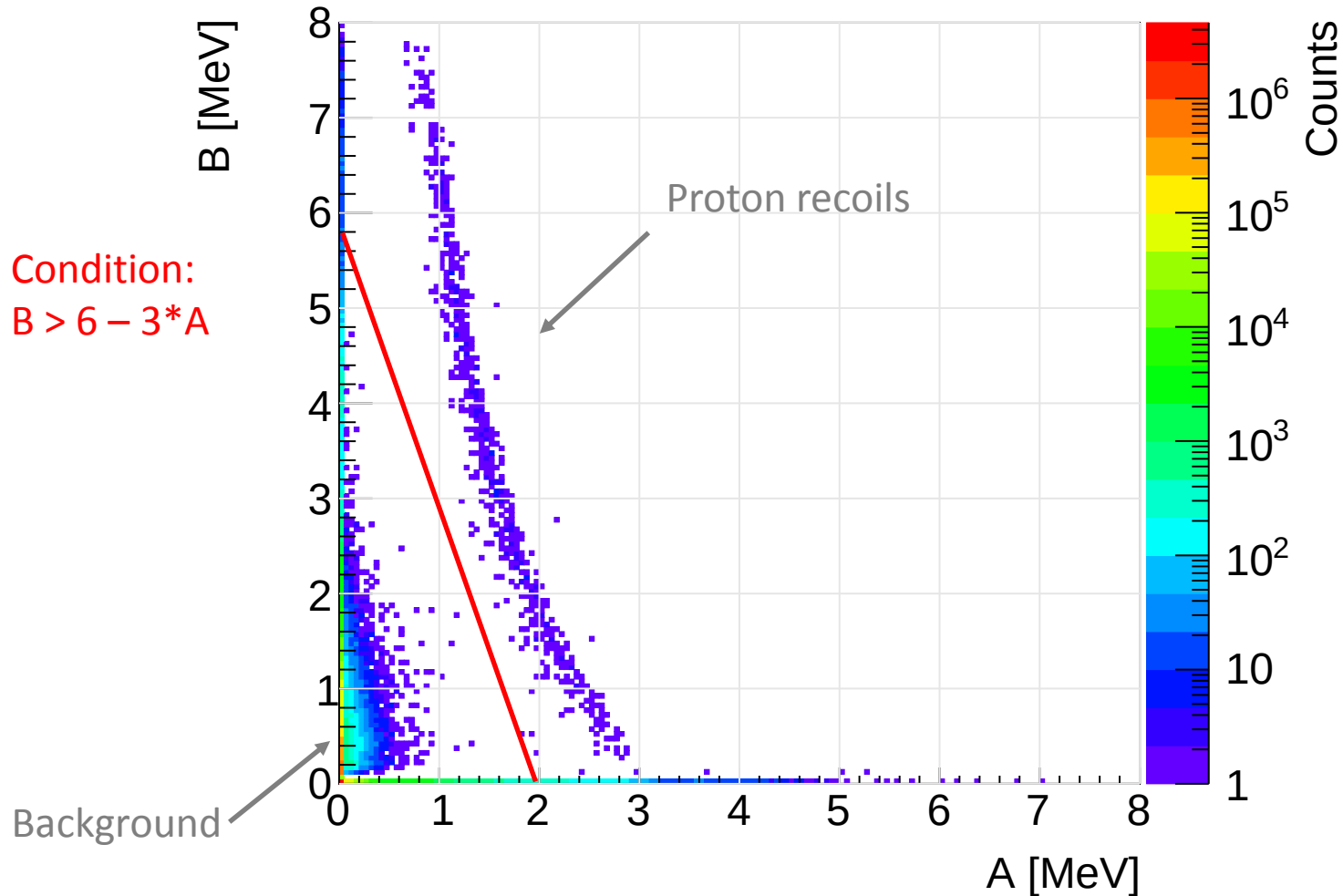


Figure 1: Neutron spectrum of the Pu-Be neutron source.

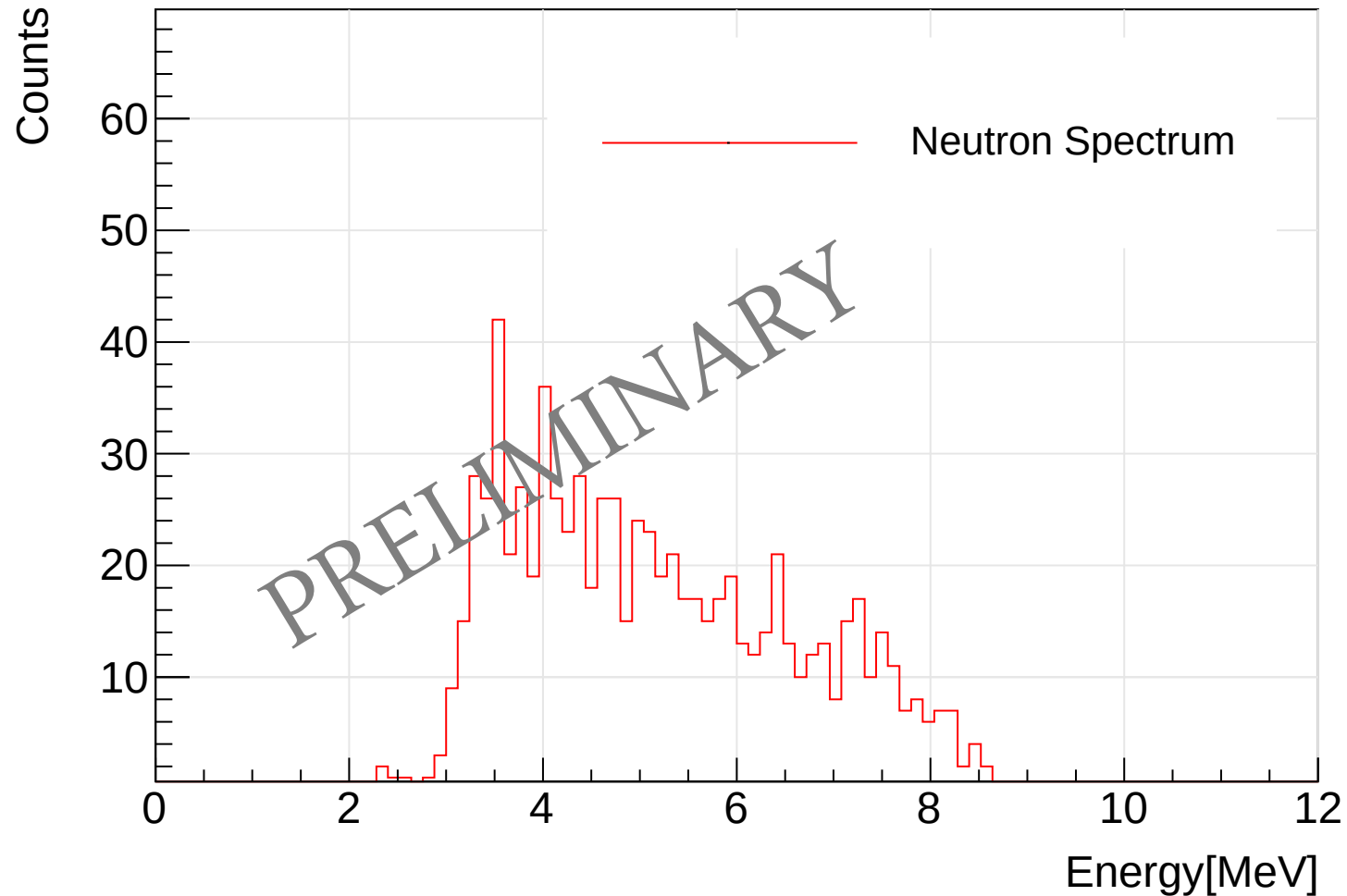
Telescope Application



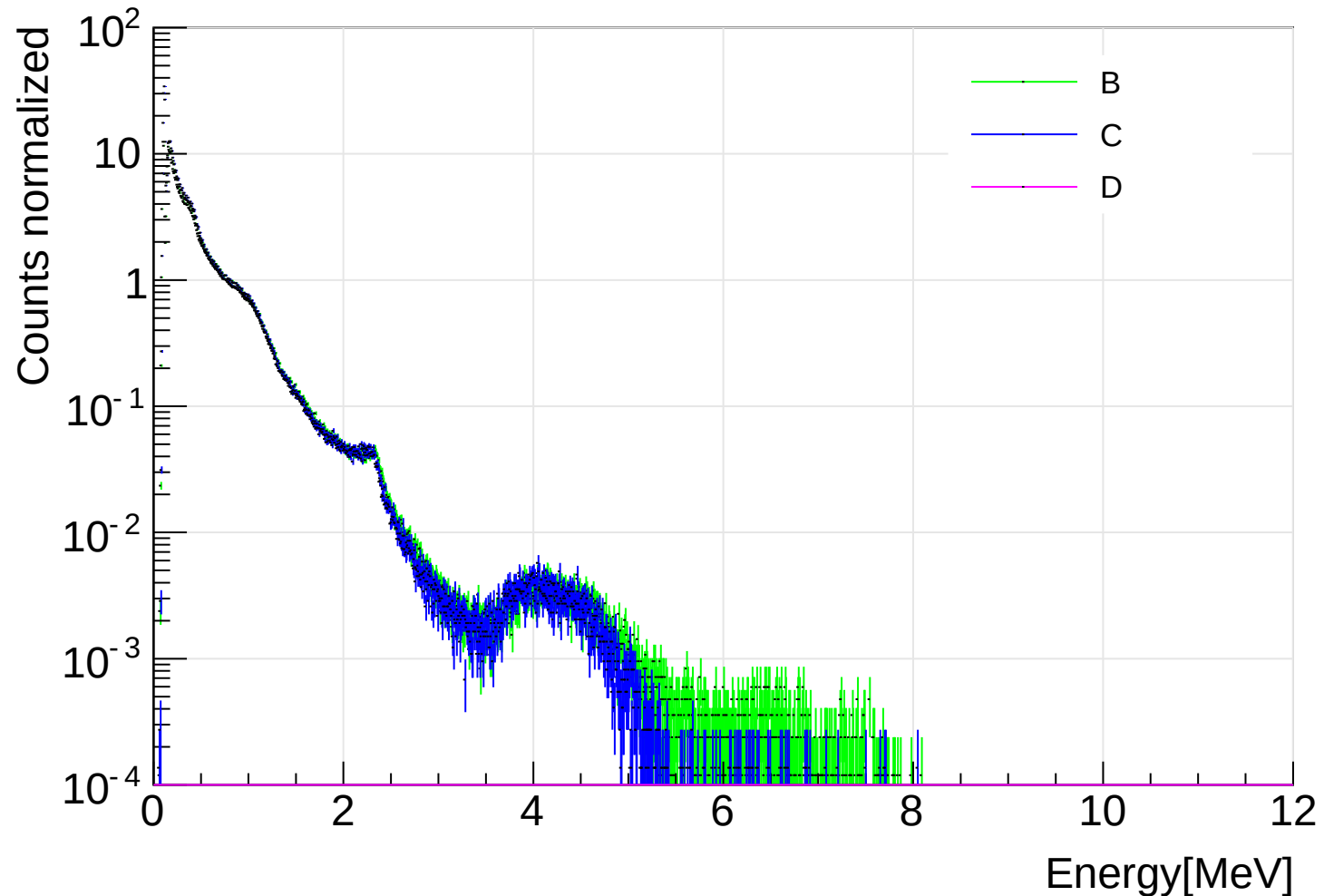
E1 over ΔE



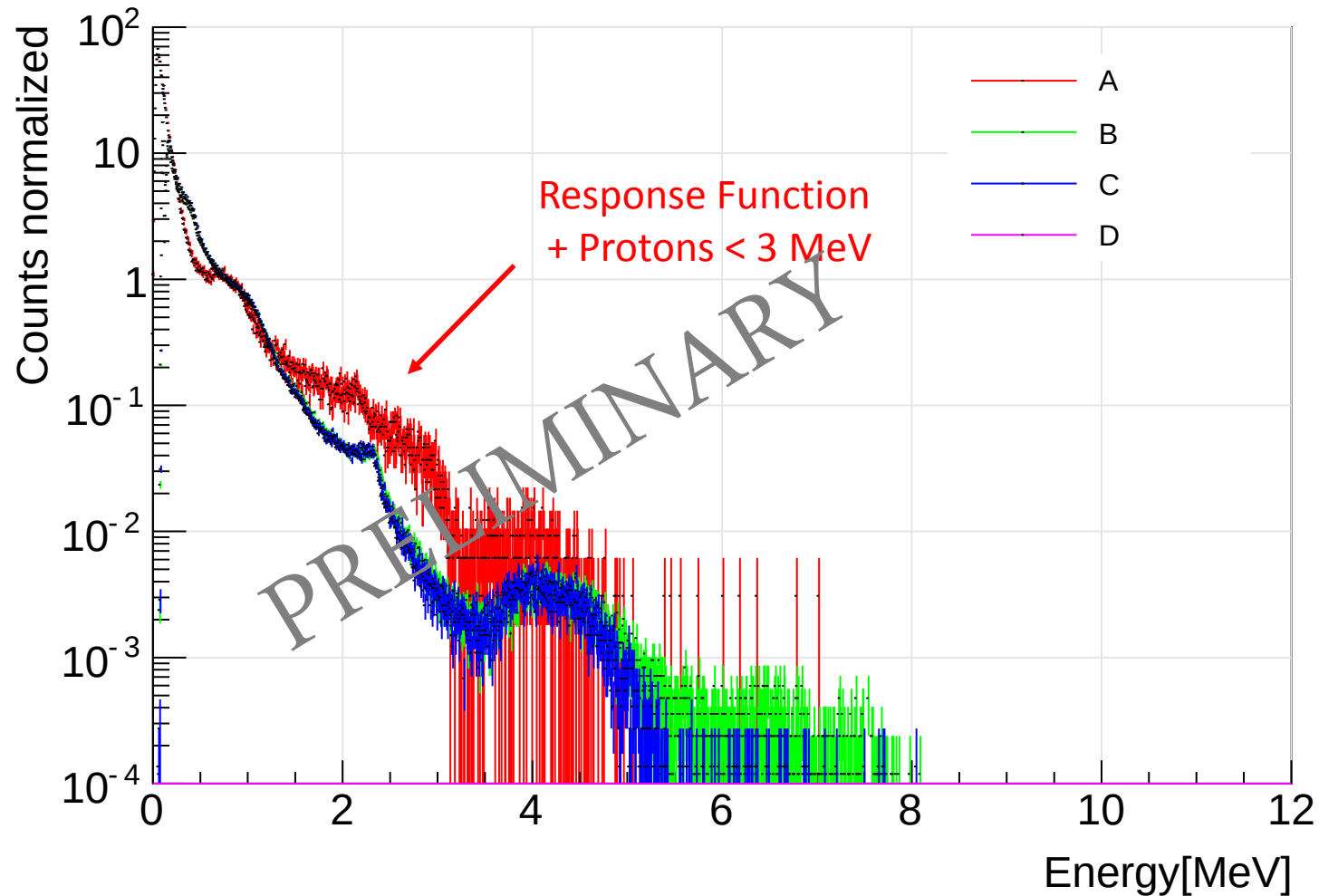
Coincidences A+B



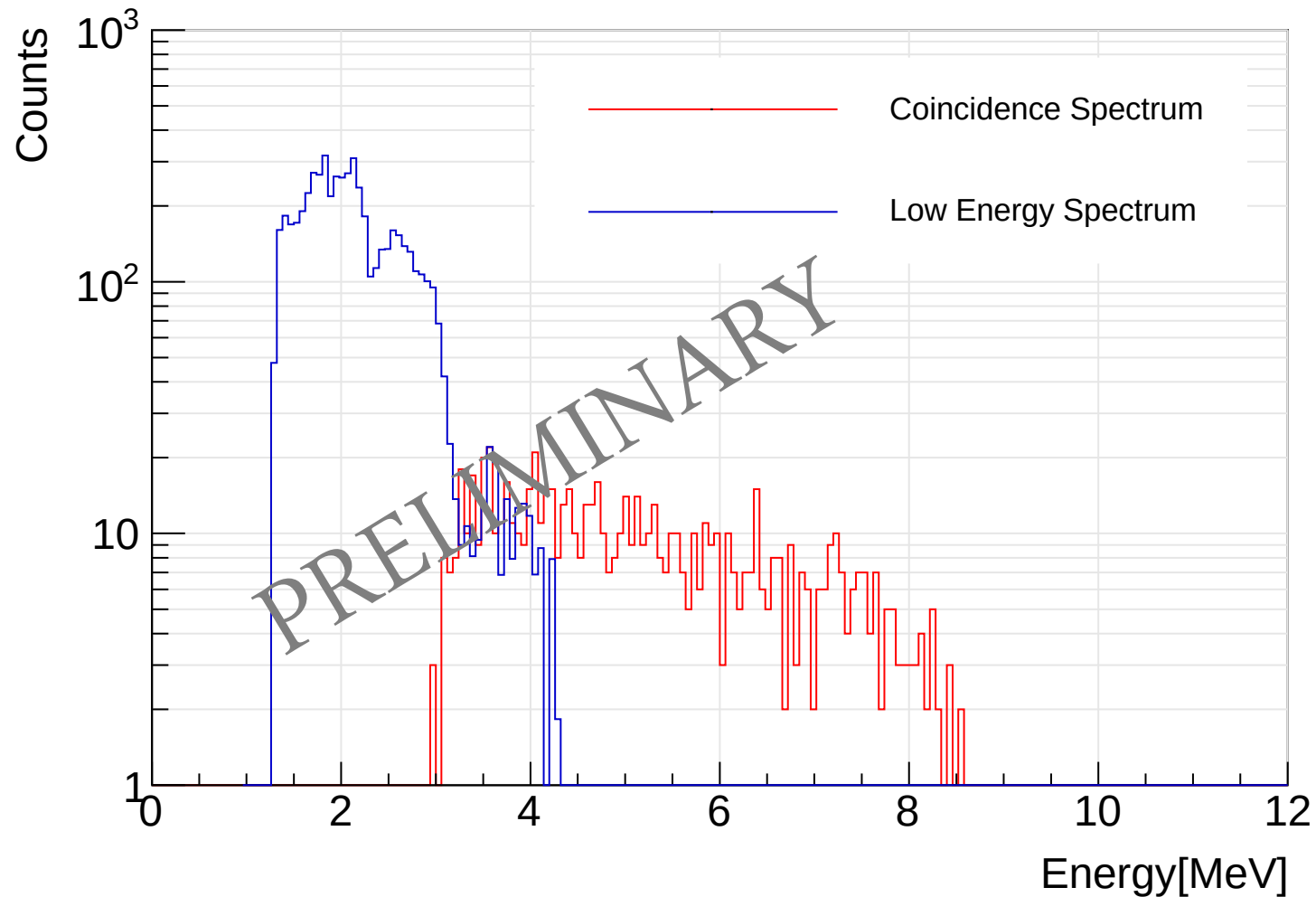
Neutron Response Function



Neutron Response Function



Neutron Spectrum



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