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First data from the Sandwich Detector in HADES

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Underground = HADES



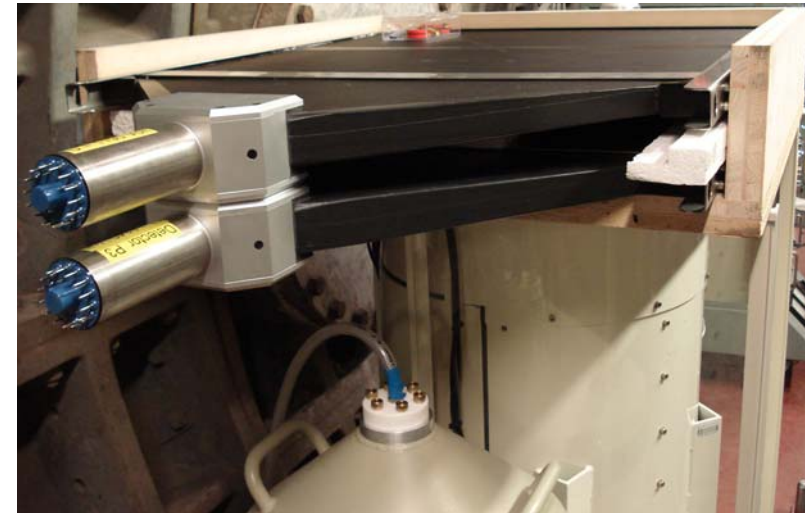
H A D E S
=
High
Activity
Disposal
Experimental
Site



The Sandwich Detector



Sandwich Design In Exploratory Research by Marissens & Hult



2 plastic scintillators on top the HPGe detectors

⇒ Muon detection

Coincidence system by EW

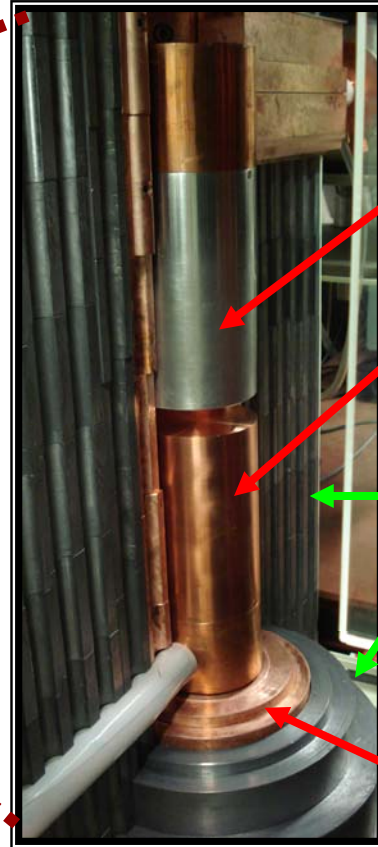
4 detectors (2HPGe & 2PS) + custom developed ROOT software

⇒ **Lower background**



The Sandwich Detector

Almost 4π measurement angle
and double efficiency.



HPGe-7

HPGe-6

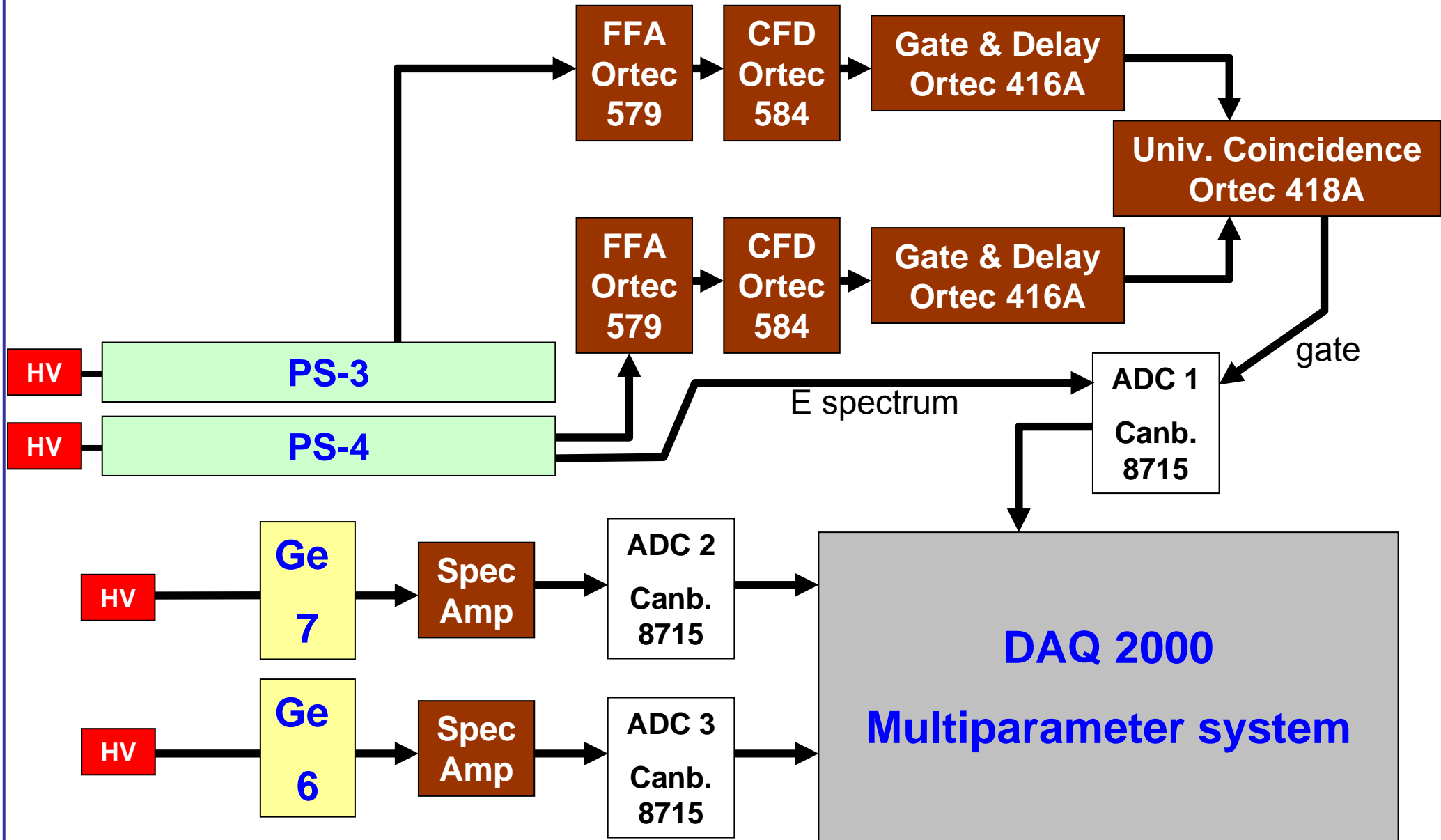
Pb shield =
radiopure lead = 2 Bq/kg

Cu lining =
radiopure copper = 3 cm

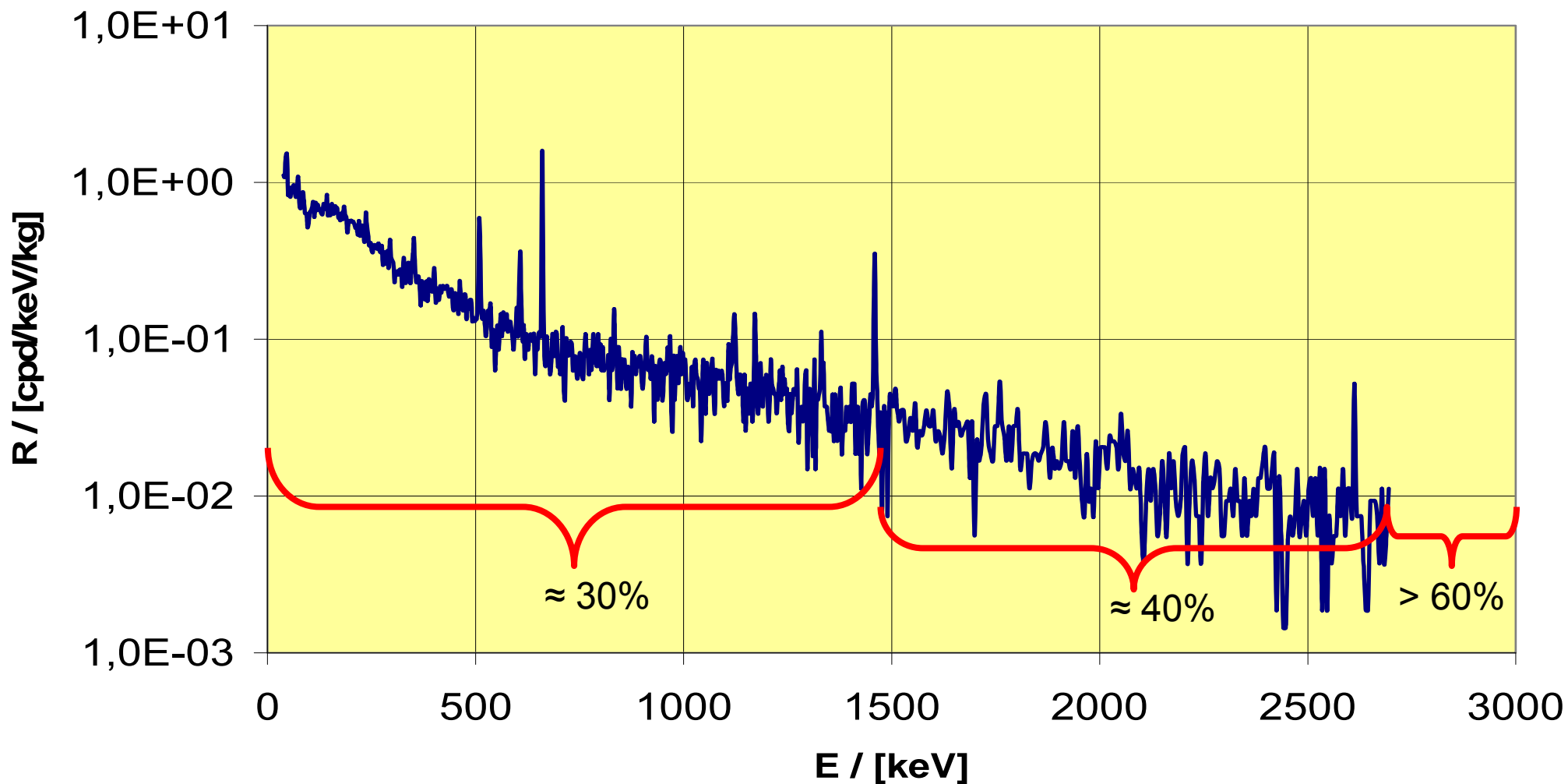
2 HPGe detectors facing each other and
accessible by opening the front lead shield.



Sandwich Electronics



Expected Bkg improvement



Preliminary background integrated countrate for the Sandwich HPGe detectors (40-2700 keV):

- Ge-6 & Ge-7 : 450 counts / (d kg)

Background in HADES : Muons

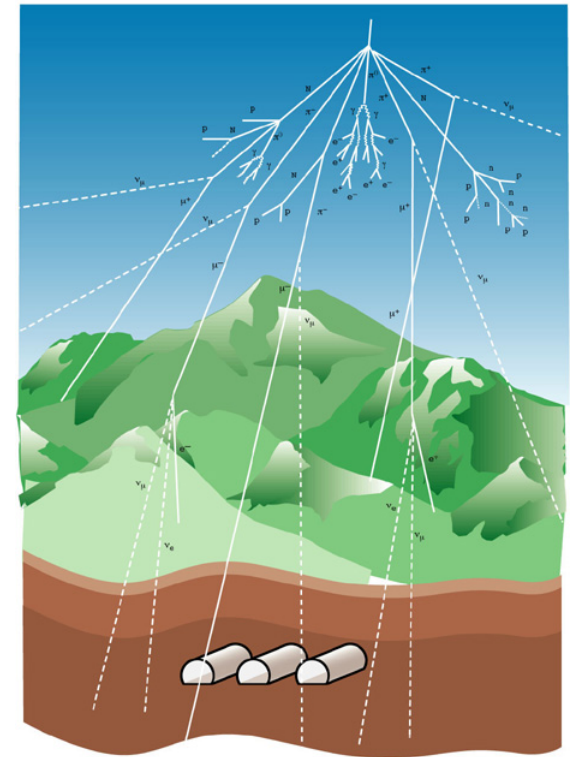
- **MUONS = the only cosmic background in HADES**

- **Muon fluence rate**

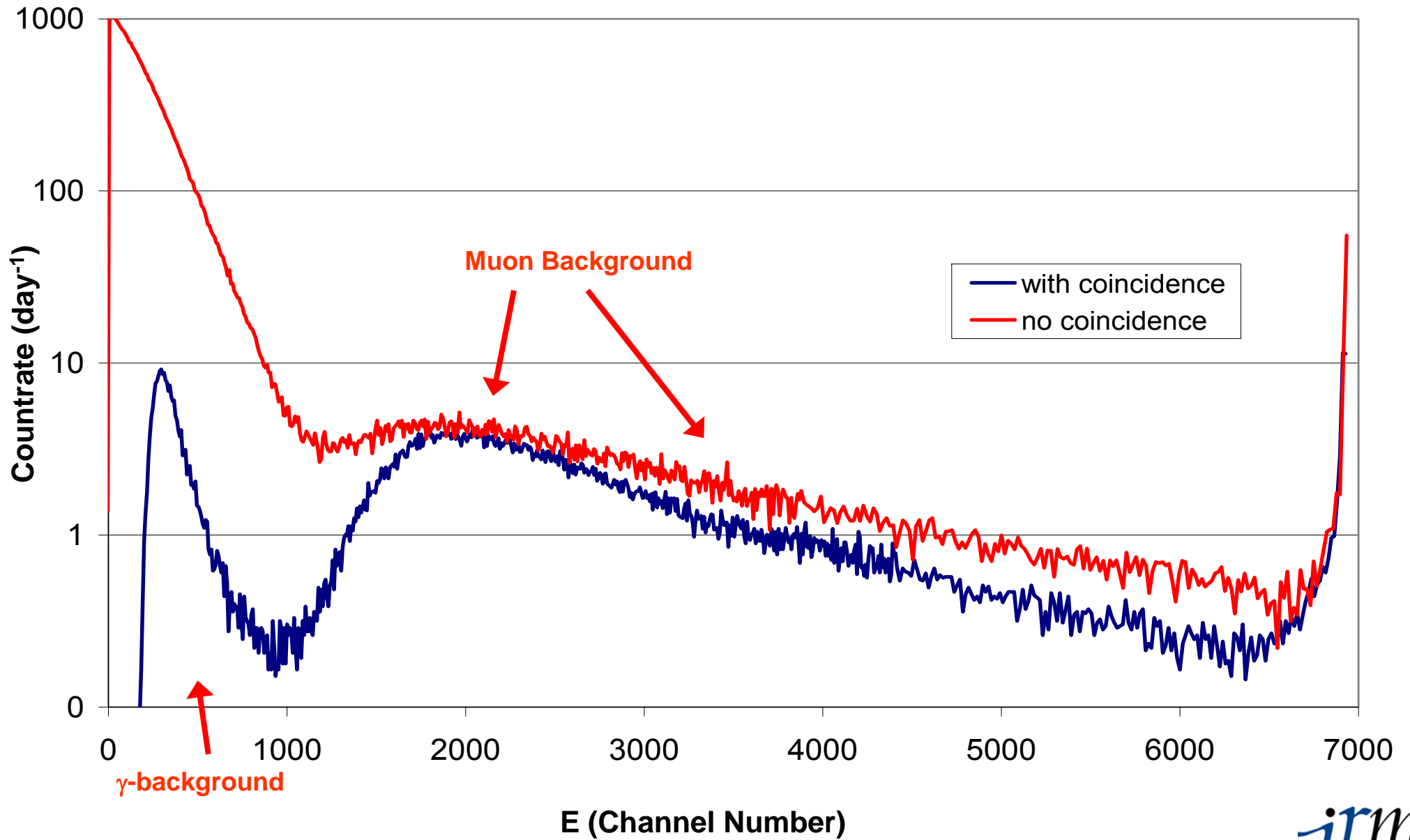
- Above ground = 160 muons / (m²·s)
- In HADES (500 m w.e) = 0,14 muons / (m²·s)

- **Energy deposit in the plastic scintillators:**

$$1,4 \text{ MeV / cm} \Rightarrow 3,5 \text{ MeV / 1'' detector}$$



Muon Background in HADES





Coincidence Spec P4

Sum spectrum for 9 days of measurements.

