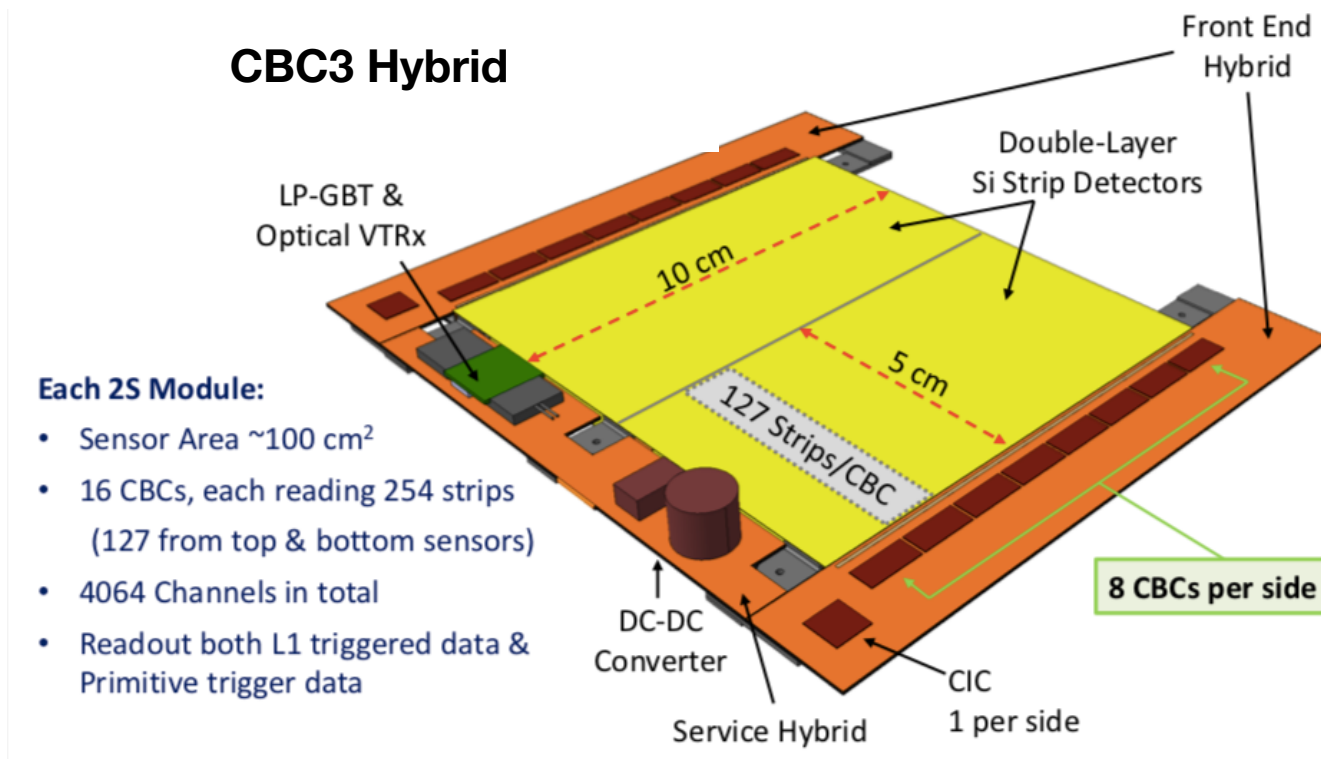


About triggering

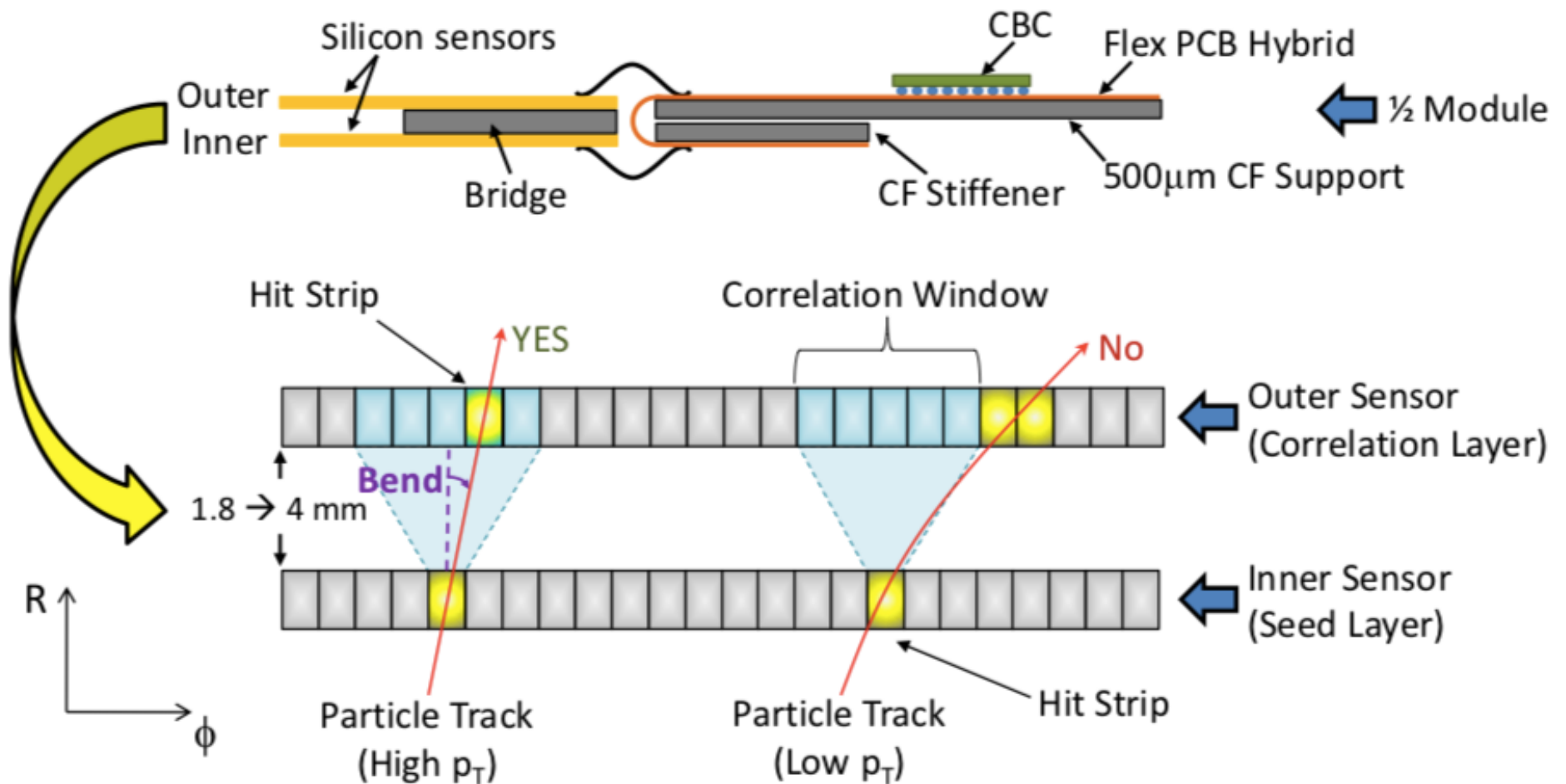
U. Marconi, INFN Bologna

CMS detectors

- Get from all the detector the stubs they provides at 40 MHz.
- A detector provides maximum three stubs at 40 MHz.

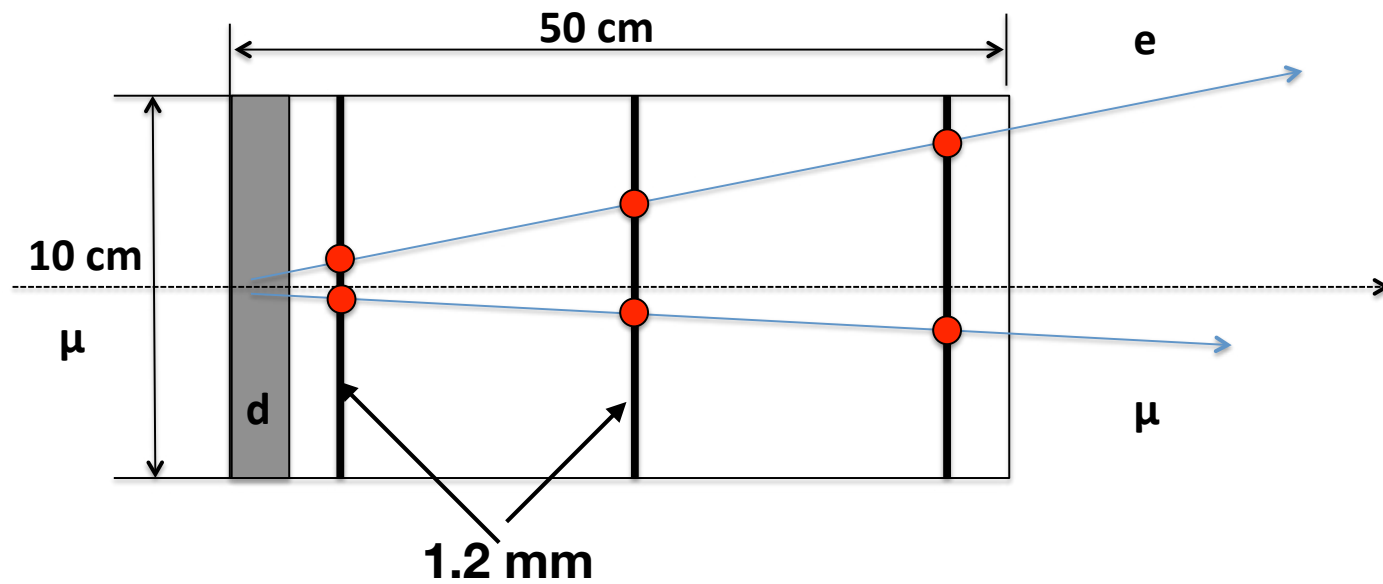


The concept of stub



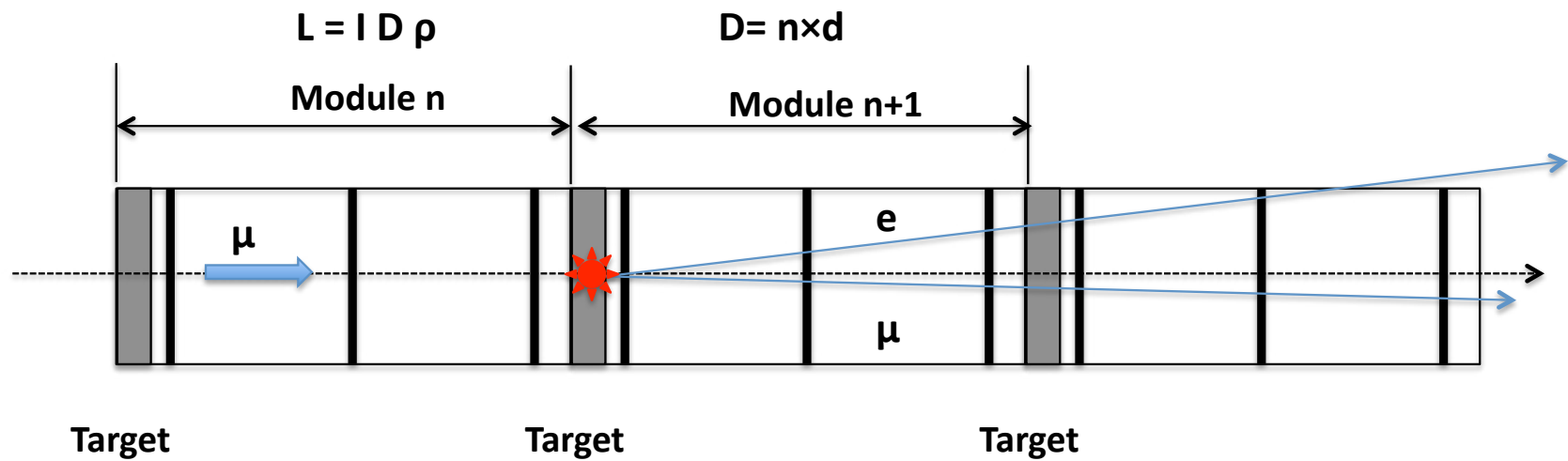
Module

- A module with 1.2 mm thick sensor



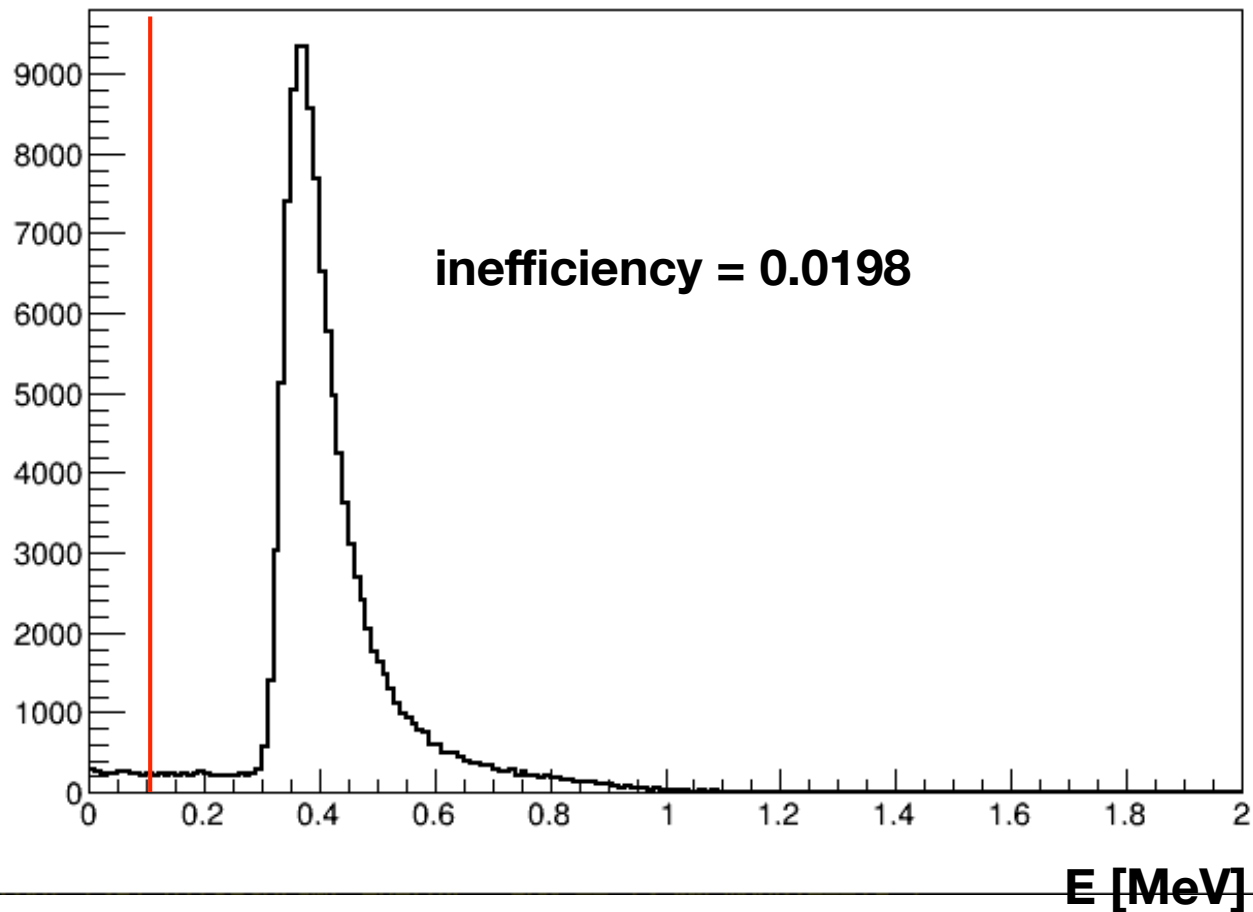
Detector

30 modules, with three detectors each



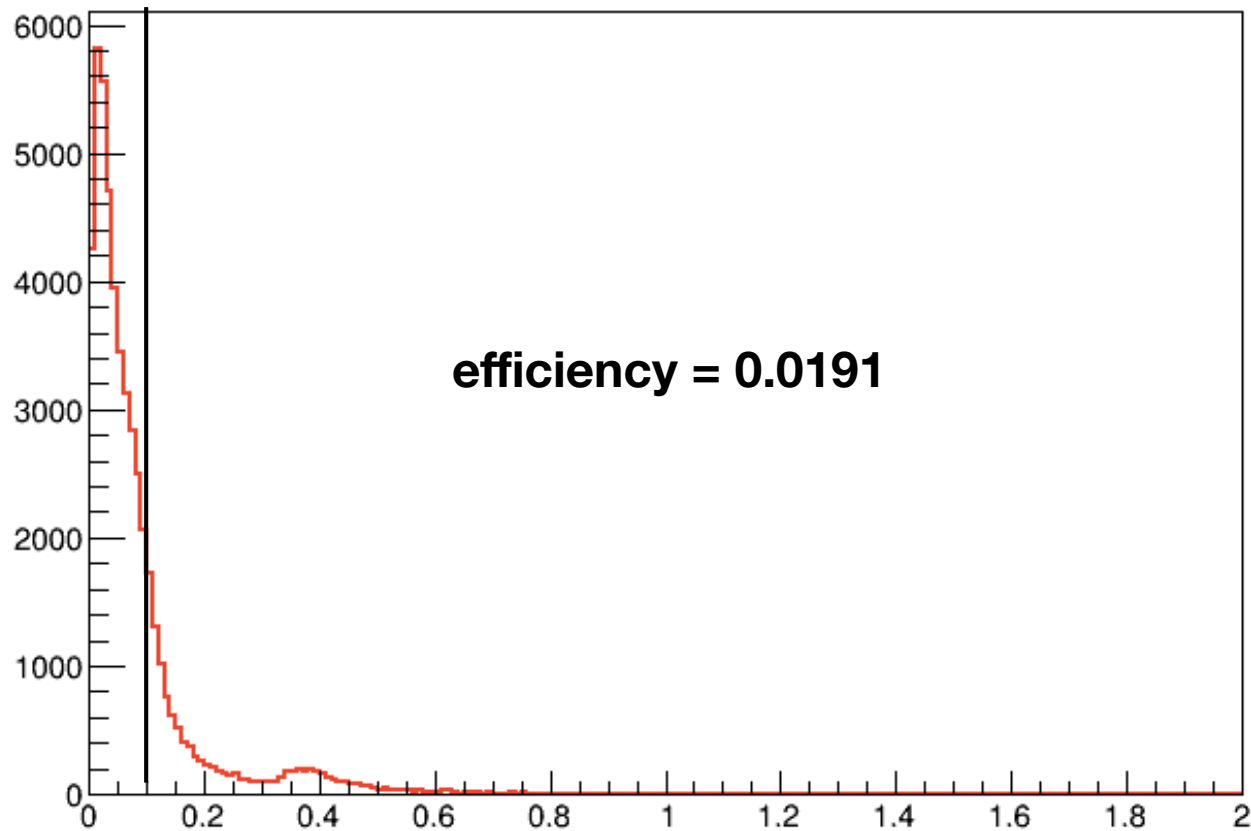
muon energy deposit

hits: energy cut at 0.1 MeV



electron energy deposit

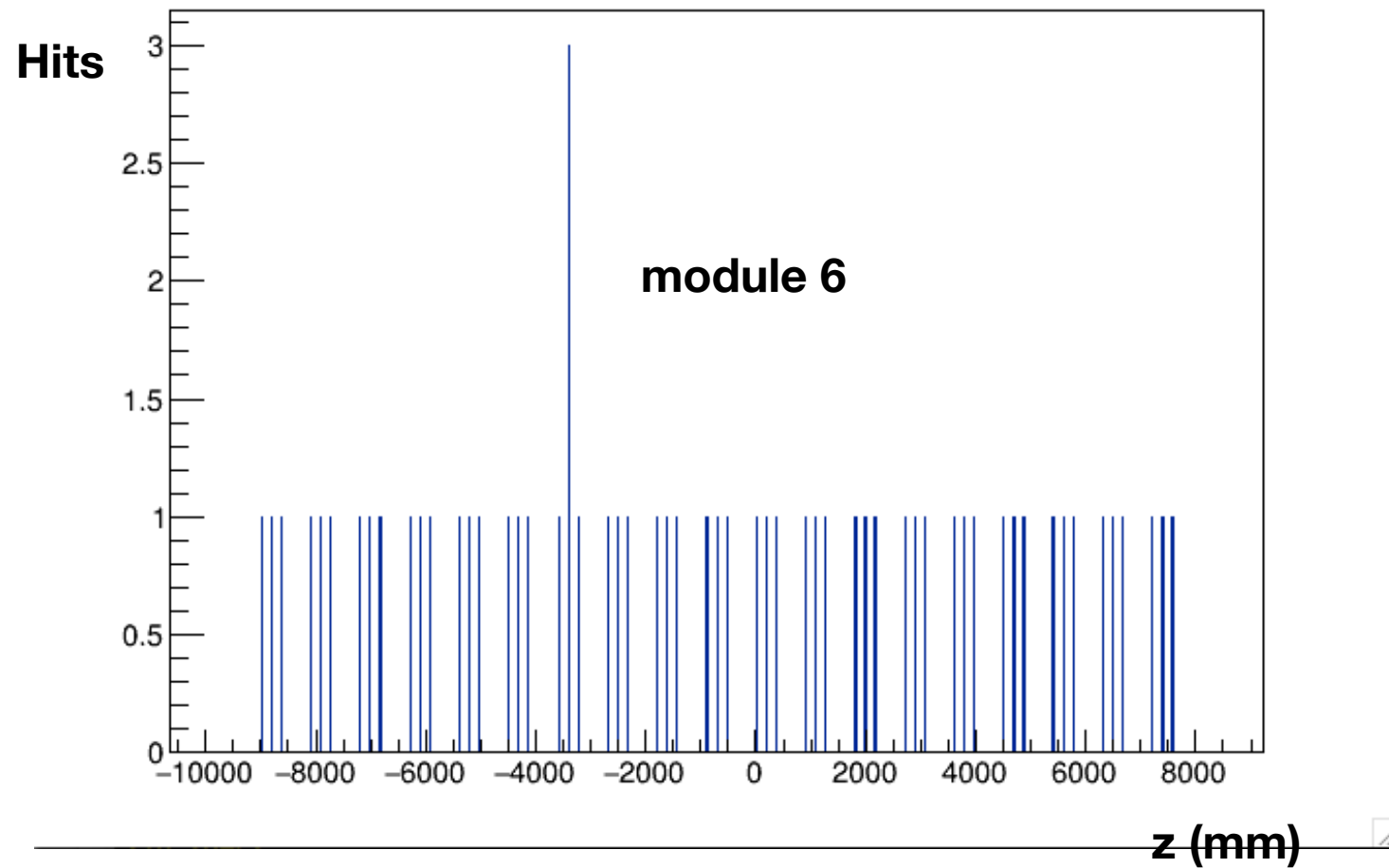
hits: energy cut at 0.1 MeV



E [MeV]

150 GeV muons

Hits due to charged particles



Trigger rate

- Trigger: at least two hits per each detector in a module
- For a detector of **30 modules** the number of triggers generated by 2×10^5 muons going through are 39180.
- The estimated trigger rate is: $39180 / (2 \times 10^5 \times 70) = \mathbf{13.7 \text{ MHz}}$
- The CBC3 sustainable trigger rate is **750 kHz**.
- Unlikely we can determine event signatures to trigger the whole detector at 750 kHz.

Number of hits/chip

N > 3 hits (stub) per chip per detector: 2e+5 muons

	chip 0	chip 1	chip 2	chip 3	chip 4	chip 5	chip 6	chip 7
detector 0	7789	5927	5635	5700	5667	5691	5992	7664
	7974	5850	5722	5731	5728	5781	5872	7790
detector 1	3565	2653	2664	2607	2627	2541	2594	3545
	3513	2725	2579	2589	2669	2629	2615	3500
detector 2	3251	2552	2415	2427	2463	2354	2464	3246
	3223	2542	2435	2354	2400	2431	2381	3205