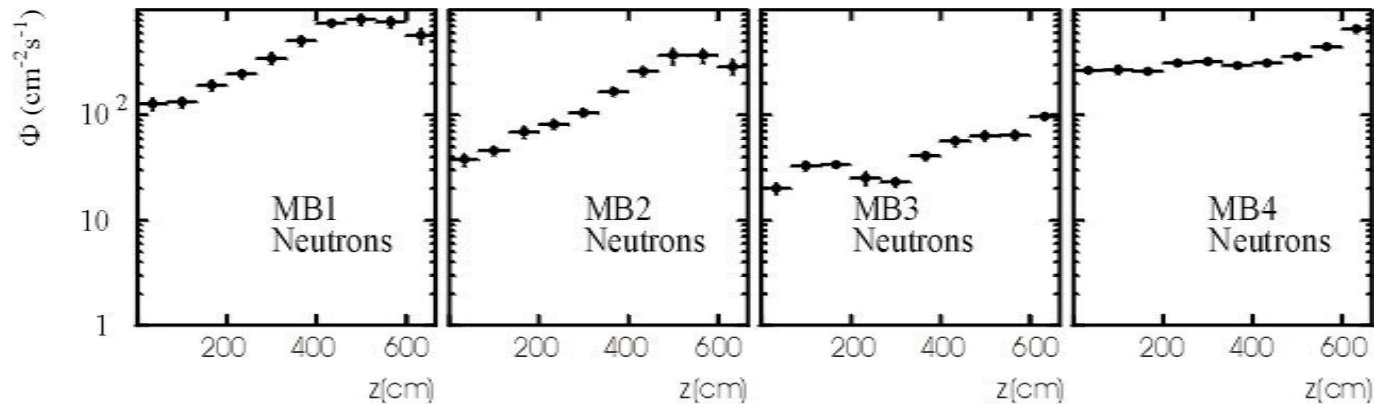


CMS barrel muon detector

DTBX Neutron flux

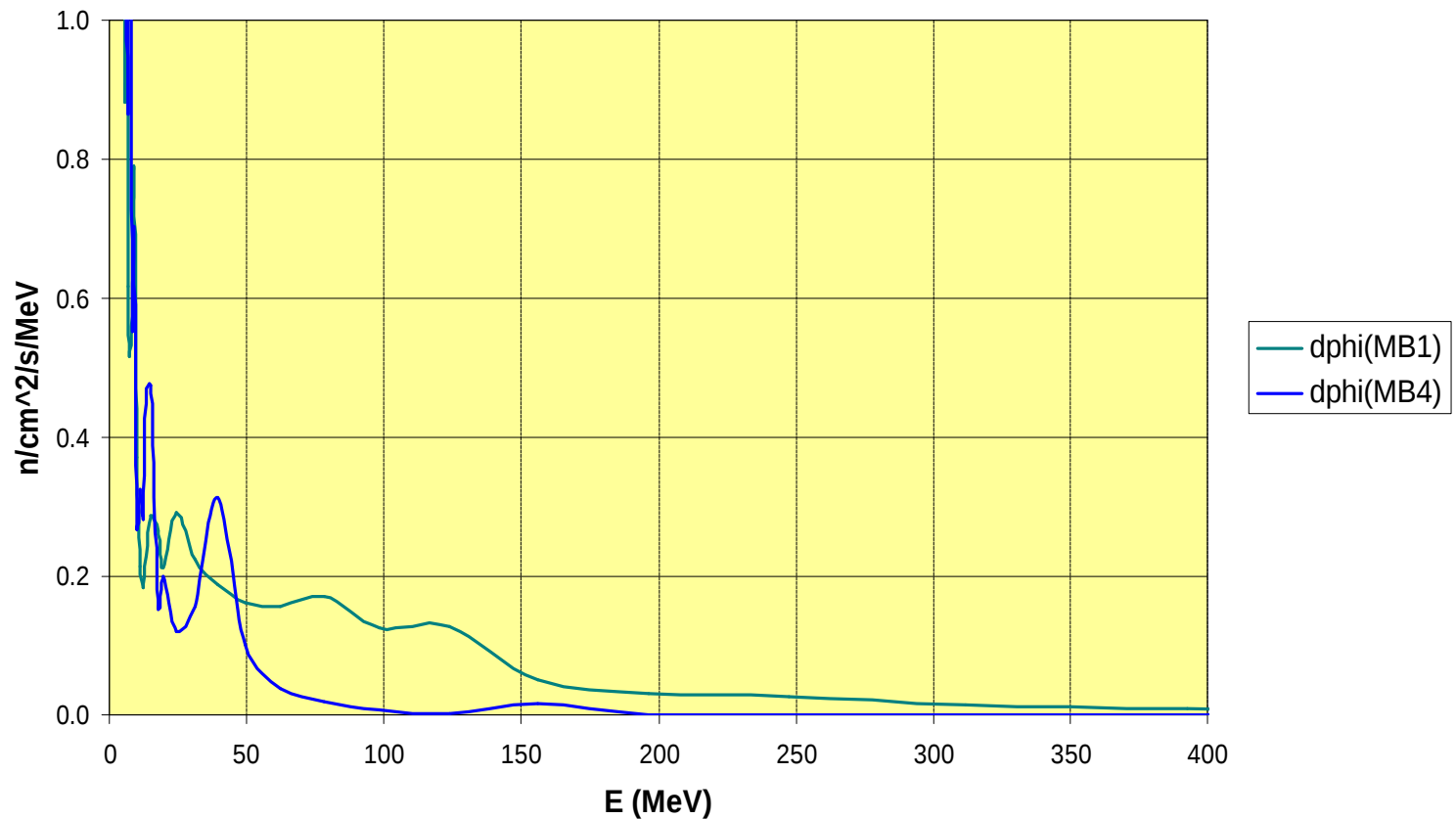
Summary of neutron radiation background in the barrel region of CMS. (From CMS TDR and for courtesy of M.Uhtinen)



Neutron flux in the DTBX chambers corresponding to peak luminosity of $10^{34}/\text{cm}^2/\text{s}$.

CMS barrel muon detector

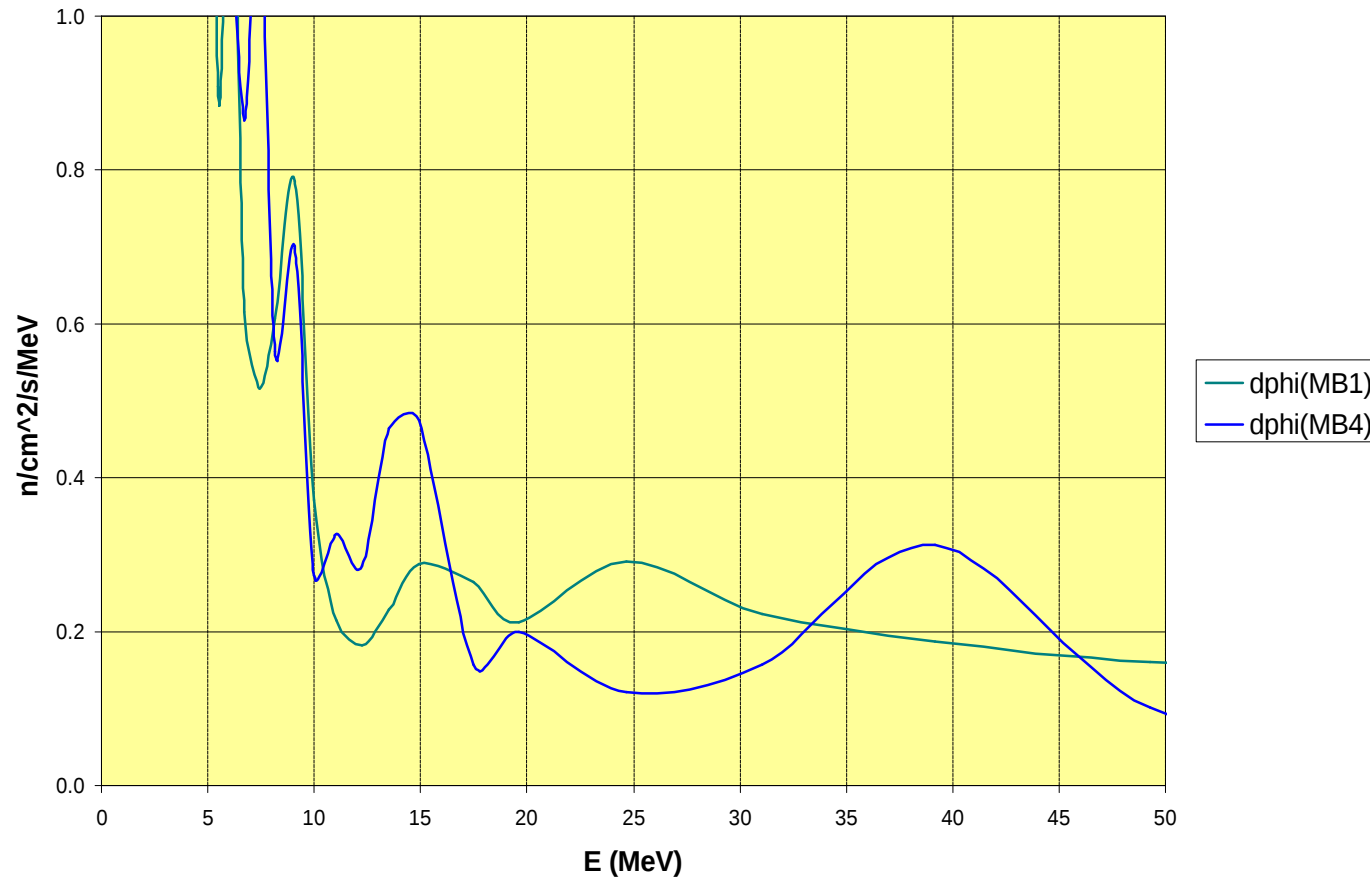
DTBX Neutron spectral fluence



Total neutron flux is about 458n/s for MB1 and 585n/s for MB4.

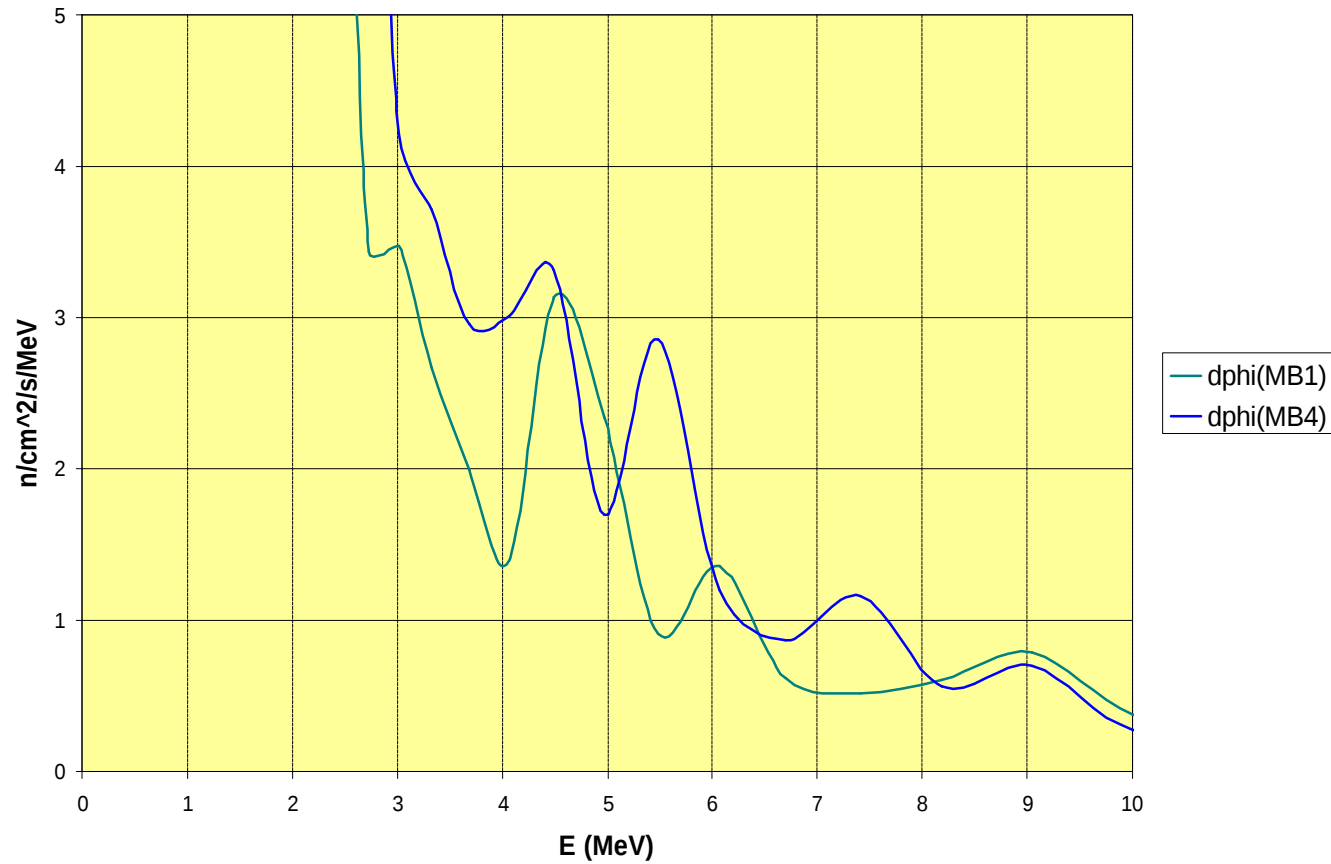
CMS barrel muon detector

DTBX Neutron spectral fluence



CMS barrel muon detector

DTBX Neutron spectral fluence



UCL Neutron Facilities

Mono-energetic beam:

- * protons on 3mm thick Li target: 10 μ A maximum current
- * collimated beam of diameter 3-12 cm over 3-10 m tof
- * peak neutrons are 30% to 50% of total neutrons
- * energy range from 25 MeV to 65 MeV

UCL Neutron Facilities
Mono-energetic neutrons

Neutron energies:

Ep (MeV) beam energy	36.4	48.5	62.9
En (MeV) Peak n energy	33.7	46.0	60.6
Et (MeV) peak thr.	31.0	43.0	56.0
Φ_n/Φ peak/total	0.41+-0.02	0.39+-0.02	0.31+-0.02

UCL neutron facilities
Mono-energetic neutrons

Neutron yield:

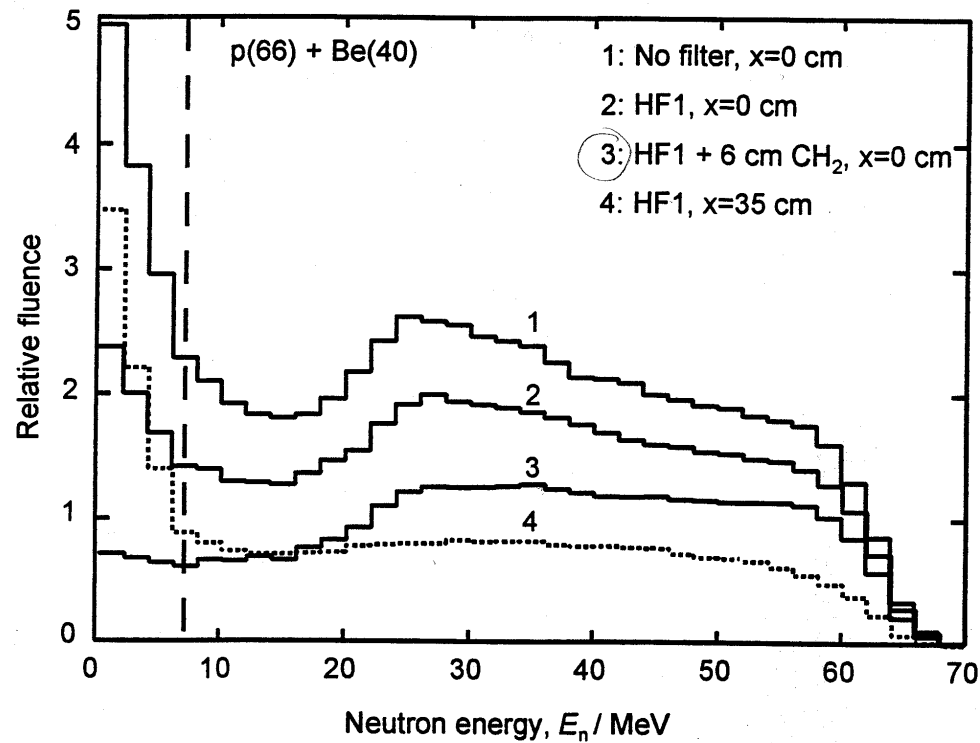
Distance from target	Fw(90%)m Diameter (mm)	Peak N yield @10μA (n/cm ² /s- n/cm ² /h)
3m	26	1.75x10 ⁵ -6.3x10 ⁸
7m	60	3.21x10 ⁴ -1.2x10 ⁸
13m	112	9.31x10 ³ -3.4x10 ⁷

UCL Neutron Facilities

Wide spectrum neutron source:

- * beam from variable shaping collimator
- * maximum irradiation area $25 \times 25 \text{ cm}^2$ @ 2m from target
- * protons on Be target @ $15 \mu\text{A}$ maximum current
- * yield of $15 \mu\text{A}$ of 65MeV protons at 2m: $3.6 \times 10^7 \text{ n/cm}^2/\text{s}$
- * flat spectrum up to proton energy (65MeV maximum)

UCL neutron facilities
Wide spectrum neutron source
Neutron spectra for p(66) on Be(40) in 10x10cm² field



HF1 is a clinical filter (2.5cm polyethylene (CH₂) + 0.8cm iron).

X is the off axis distance.

Plot vertical axis is arbitrarily scaled.