

The path to the eD generator

- Following Marco steps:
 - D2 photodisintegration
 - Quasi-elastic
 - D2 Electro disintegration (?)
 - DIS (T. Hobbs)

Acceptance is possible through:

- Toy MC
- G4SBS

Marco numbers:
 p from photodisintegration:
 314MHz (full chamber)

1A

Event rates from D2 photodisintegration

Rate = $t_{D2} \cdot I_e \cdot \int d\omega \Gamma_\nu \cdot \sigma(\omega) \cdot A(p)$

- $\mathcal{L} = t_{D2} \cdot I_e \sim 2.9 \cdot 10^{36} \text{ cm}^{-2}/\text{s}$ (from PR12-15-006: $I_e=60\mu\text{A}$ and 400mm D2 target at 77K/1atm)
- Γ_ν – photon flux
- $\sigma(\omega)$: Deuteron photodisintegration cross section

(using Weizsacker-Williams method)

${}^2\text{H}(\gamma, n){}^1\text{H}$

Schiavilla et al., PRC 72, 034001 (2005)

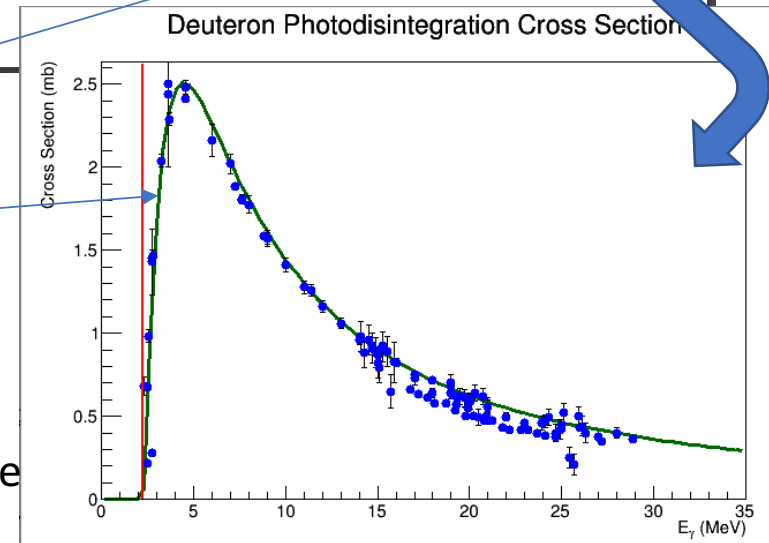
(?)

Need some help here

Reference doesn't provide an explicit formula.

Bethe-Peierls formula
 Didyk, A.Y. & Wiśniewski, R. Phys. Part. Nuclei Lett. (2013) 10: 273.

Blue dots experimental points from EXFOR database



Quasi-elastic

Marco's approach (Sep 21, 2017):

- Elastic cross section as an upper limit of quasi-elastic scattering
- Upper limit on rates

Marco numbers:
p from quasi-elastic: 246MHz
(full chamber)

- For the moment, just scripts to test the functions and the outputs (inventing the wheel, reproducing old numbers?)
- Later, integrate into the g4sbs simulation (?)
- T. Hobbs model into the generator

This is the rough plan to follow, suggestions, corrections and/or point errors are appreciated.

Thank you Arun, Florian and Eric for discussions about it.

Marco, Feb 22, 2018:

- Use of the EPC code by Lightbody and O'Connell
- GEMC/G4 estimations

↓
nqfs code from K.Slifer
(update of the EPC code)

