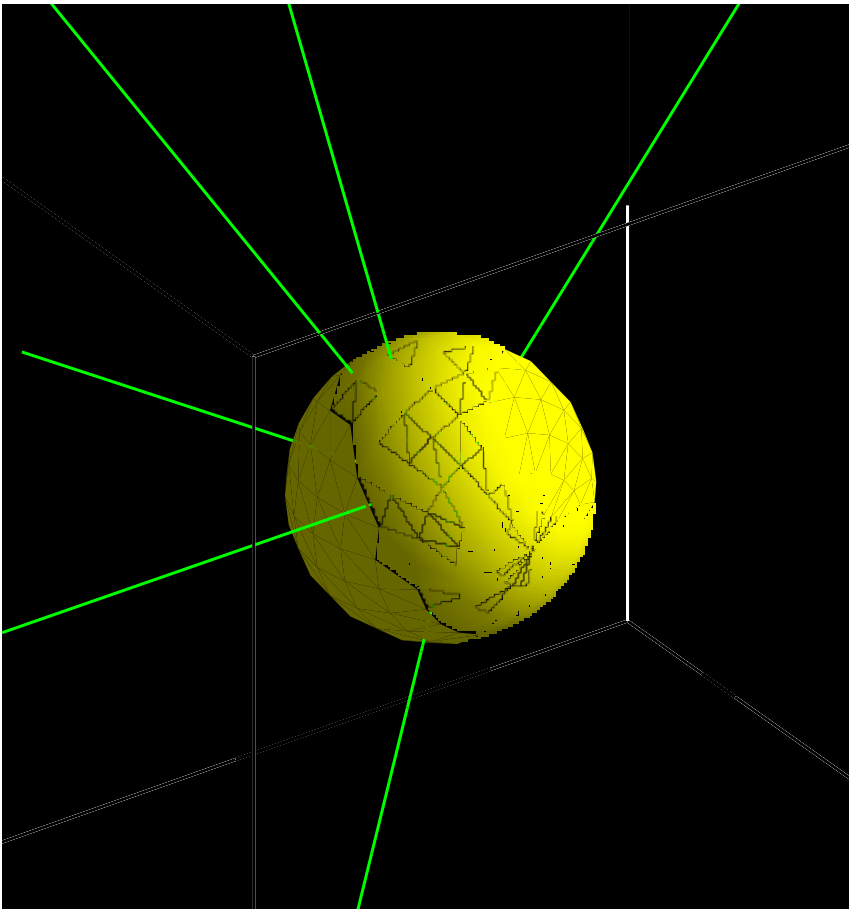# Attenuation (& Absorption)

using a very artificial, yet interesting Setup

- **Sphere** of **variable Radius** **& Material**
- Source / Sources at the center emitting Gammas, Electrons or Positrons

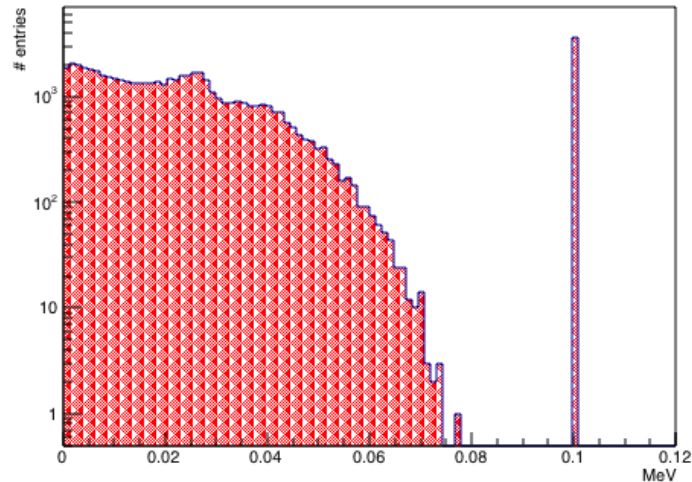# Attenuation (& Absorption)

- **Attenuation.txt (Standard Version)**
- **VisuOnOff: novisu; visu;**
- **CrysMat: Water; Plexiglass; Air; Lead; Copper; Tungsten; Lung; Liver;**
- **Rad: 50; 1; 2; 5; 10; 20; 70; 100; 200; 300;**
- **particle: gamma; e-; e+;**
- **Compton: enabled; disabled;**
- **Photo: enabled ; disabled;**
- **Annihil: disabled; enabled;**   ←selectable Physics Effects
- **Brems: enabled;disabled;**
- **Ioni: enabled;disabled;**
- **MScat: enabled;disabled;**
- **Src_E: 10; 30; 50; 80; 90; 100; 120; 140; 160; 200; 240; 364; 400; 511; 600; 800; 1000; 1600;**
- **Src_Act: 10; 20; 50; 100; 1000; 10000; 100000;**
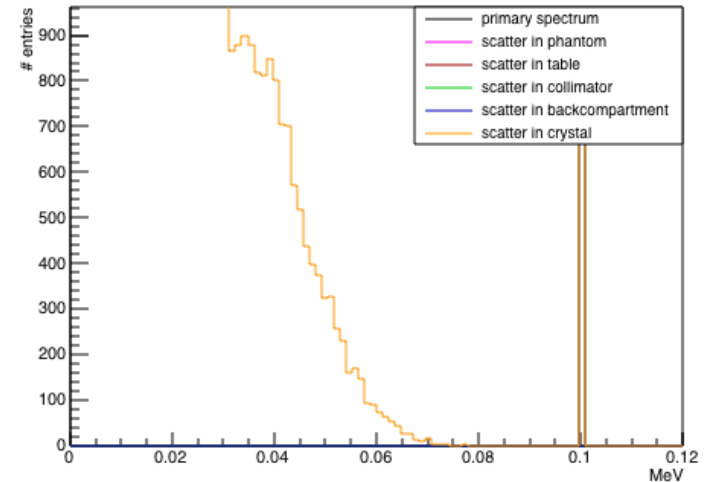
Attenuation   (& Absorption) → Analysis

Attn_Water_50mm_Com_enabled_Pho_enabled_Ann_disabled_
Brems_enabled_Ioni_enabled_MScat_enabled_gamma_**100 keV**_10000 Bq

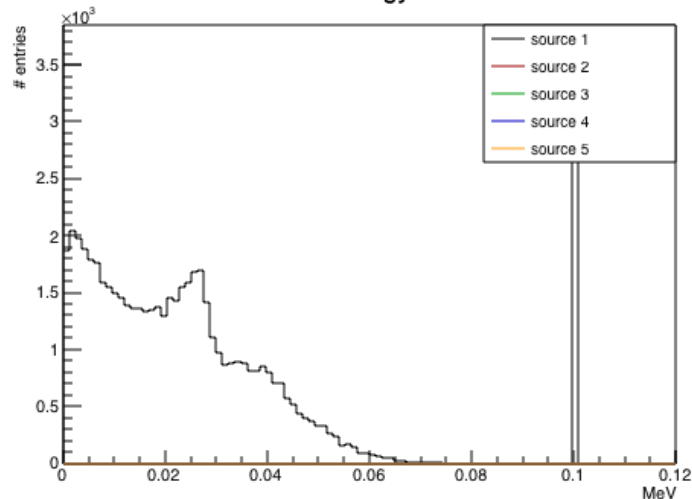Attn_Water_50mm_Com_enabled_Pho_enabled_Ann_disabled_
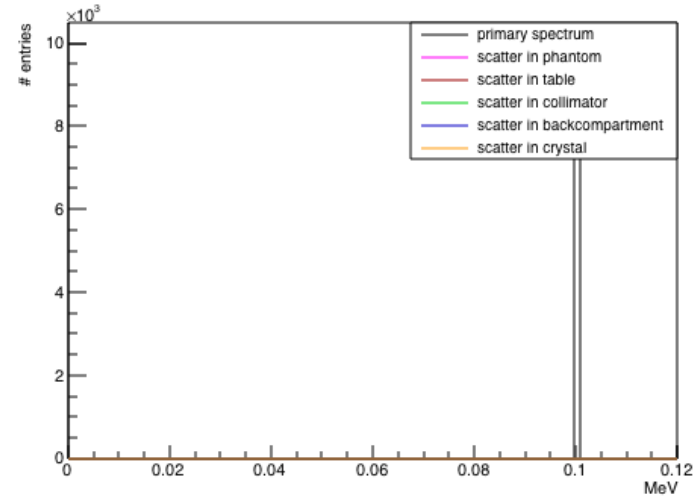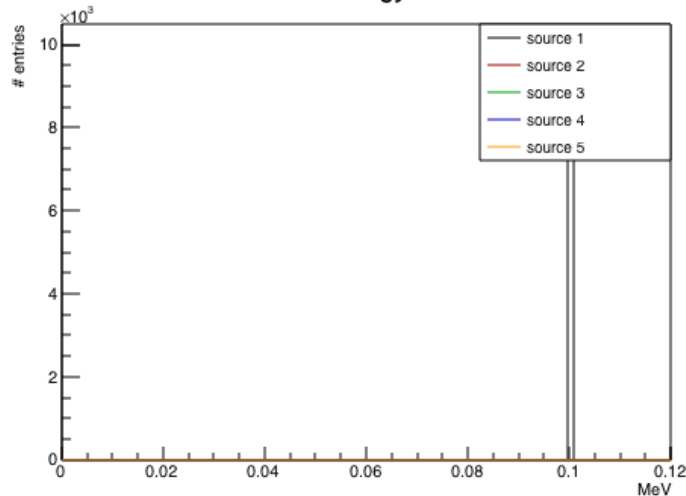Brems_enabled_Ioni_enabled_MScat_enabled_e-_100 keV_1000 Bq
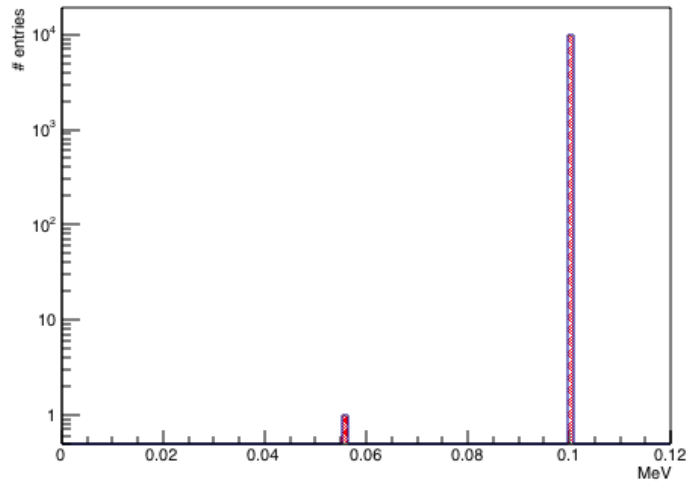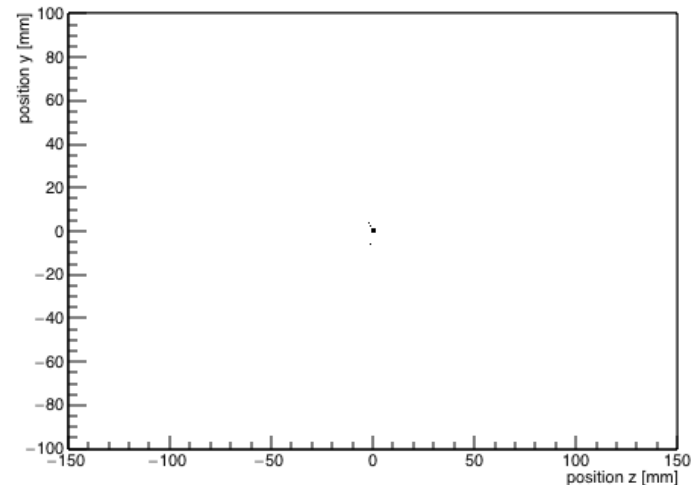
Attenuation   (& Absorption)

- **Attenuation_ms.txt   (Extended Version)**
- **VisuOnOff: novisu; visu;**
- **CrysMat: Water; Plexiglass; Air; Lead; Copper; Tungsten; Lung; Liver;**
- **Rad: 50; 1; 2; 5; 10; 20; 70; 100; 200; 300;**
- **→ multiple sources @ different energies →**
- **src_gam_centr_E5_S1;   gamma   @ 30, 140, 364, 511, 1200 keV**
  src_e-_centr_E5_S1;   e-   @ 10, 150, 400, 750, 1000 keV

- **Compton: enabled; disabled;**
- **Photo: enabled ; disabled;**
- **Annihil: disabled; enabled;**
- **Brems: enabled;disabled;**
- **Ioni: enabled;disabled;**
- **MScat: enabled;disabled;**
- **Src_Act: 10; 20; 50; 100; 1000; 10000; 100000;**
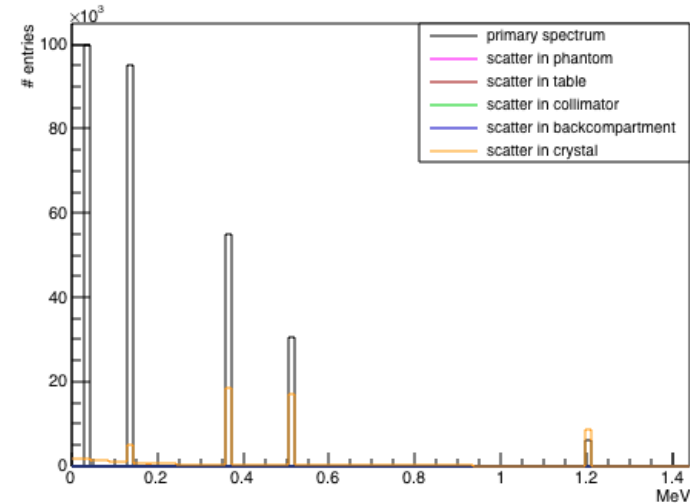
←selectable Physics Effects

Attenuation   (& Absorption) → Analysis

Attn_**MS**_Lead_5 mm_Com_enabled_Pho_enabled_Ann_disabled_
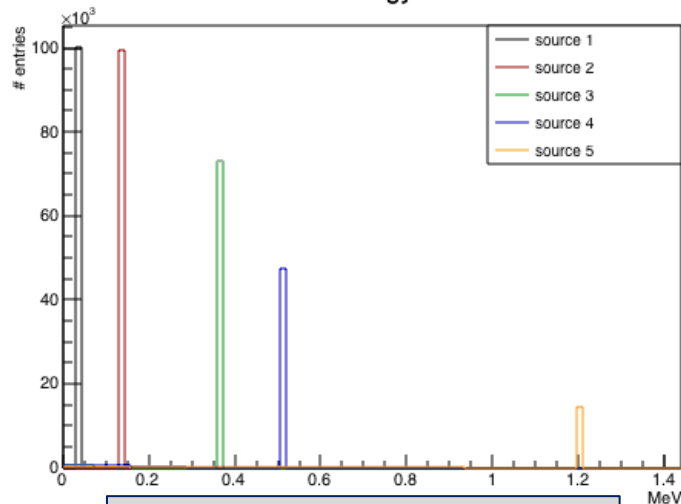Brems_enabled_Ioni_enabled_MScat_enabled_src_gam_centr_E5_S1_10000
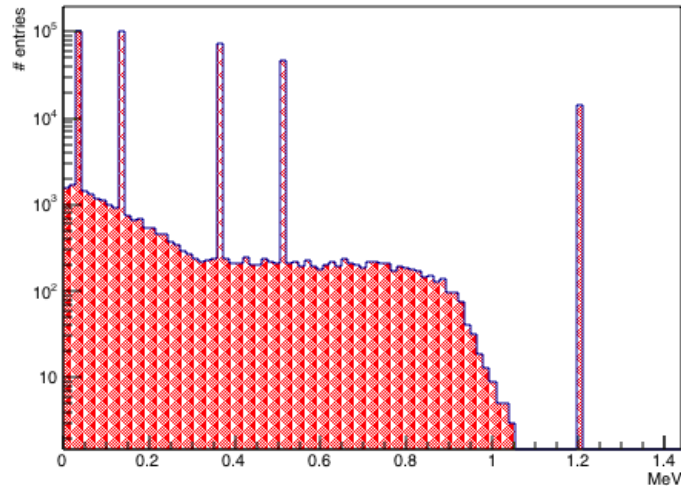
30, 140, 364, 511, 1200 keV
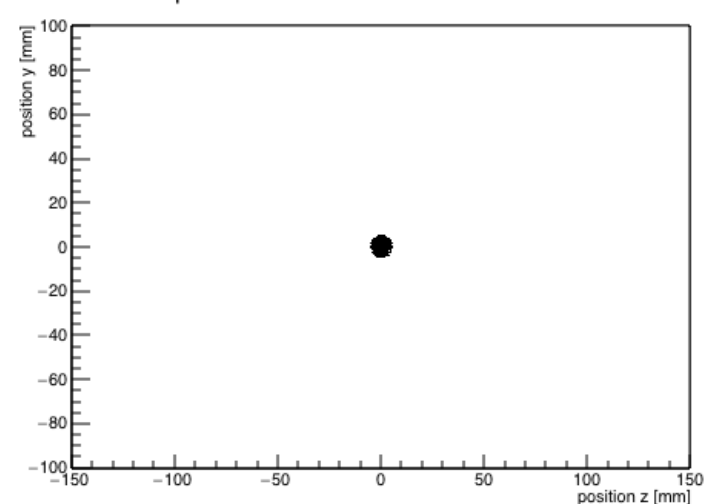
<u>Contact</u>

Prof. Dr. Uwe Pietrzyk

Institute of Neuroscience and Medicine (INM-4)
- Medical Imaging Physics -
Forschungszentrum Jülich GmbH
U.Pietrzyk@fz-juelich.de
http://www.fz-juelich.de

and

School of Mathematics and Natural Science (C)
- Medical Physics -
Bergische Universität Wuppertal
Uwe.Pietrzyk@uni-wuppertal.de
http://www.medizinphysik.uni-wuppertal.de
Germany