microTPC simulation

Igal Jaegle

University of Hawai'i at Mānoa

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Figure-Of-Merit

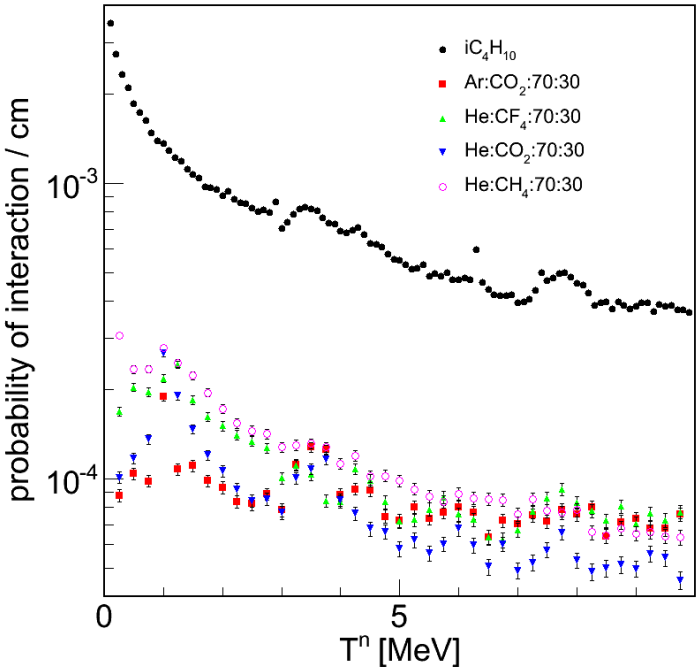
Figure-Of-Merit is derived from what I did in arXiv:1110.3444

$$\frac{dFOM}{dT_R}(P) = \frac{\mu_A^2}{\mu_N^2}.\rho(P).V\frac{d}{dT_R}\Gamma^A.\frac{\int_0^{z_{max}=33.33cm} L_{L>L_0(P)}(T_R,P)dz}{L(T_R,P)} \quad (1)$$

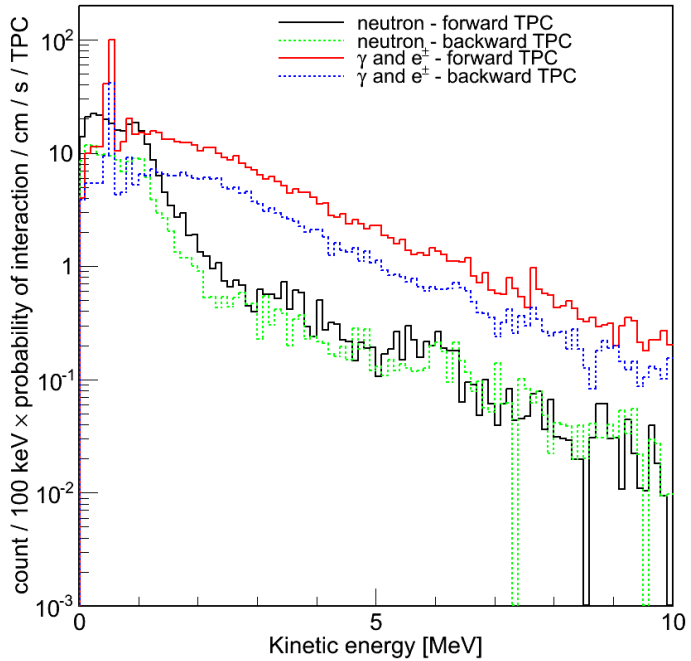
in neutron case can be expressed by:

$$\frac{dFOM}{dT_R}(P) = \rho(P).V\frac{d}{dT_R}\frac{\int_0^{z_{max}} L_{L>L_0(P)}(T_R,P,\varepsilon)dz}{L(T_R,P,\varepsilon)} \quad (2)$$

- probability of interaction

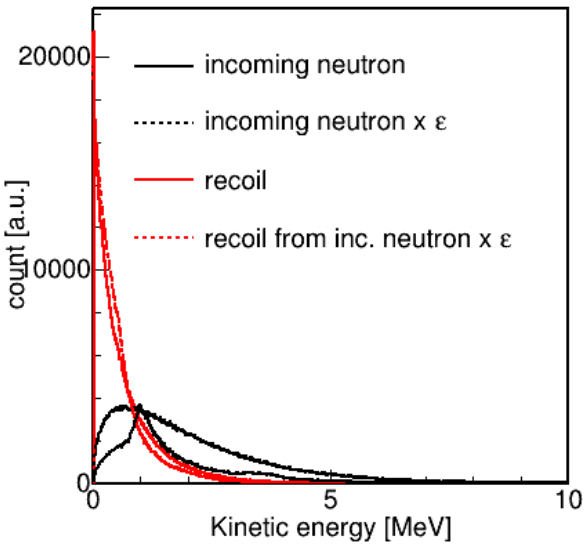


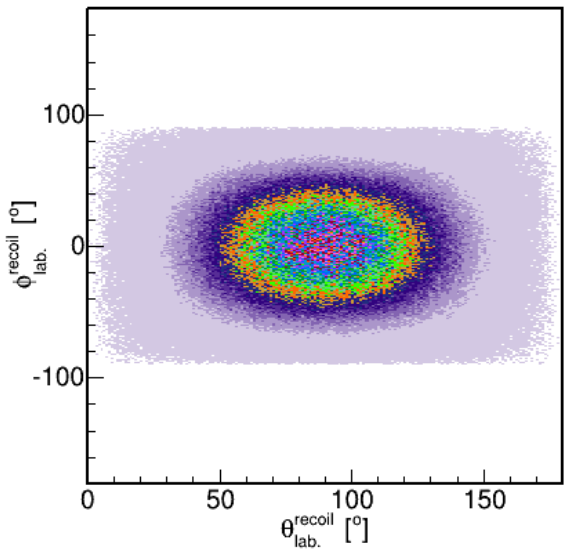
- expected rate of interacting particles in a single TPC



EvtGen

- neutron source: start with the neutron energy distribution
- $n + A^{gas}$: combine with the interaction probability per centimer
- $A^{gas}_{recoil} + n'$: elastic scattering (fast MC simulation)

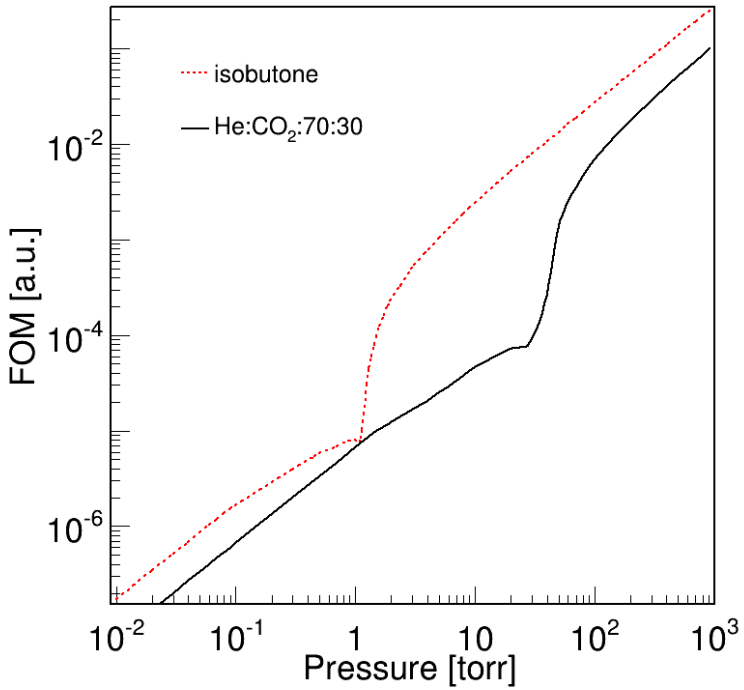




FOM construction

- interaction probability per centimeter
- MAGBOLTZ
- SRIM
- L $>$ 6 x σ and L^{max} $=$ 3 cm

- FOM v. pressure



- FOM v. drift distance