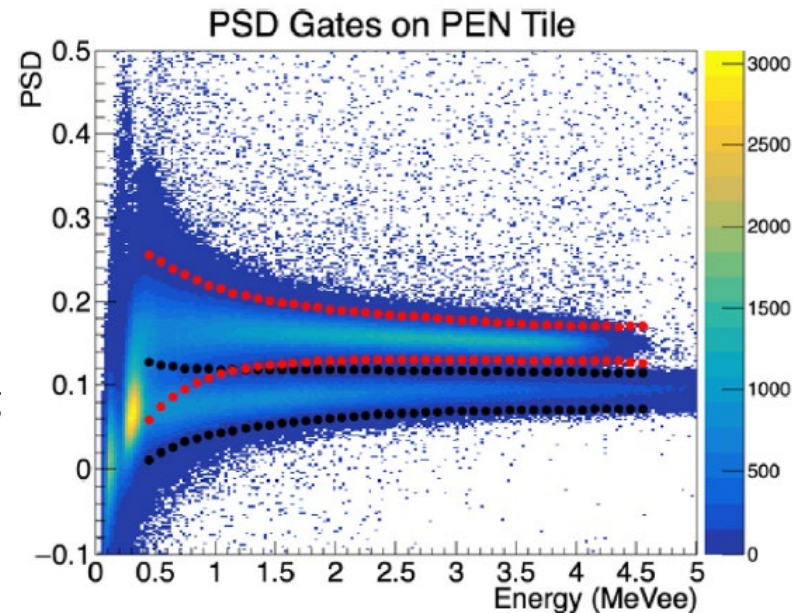
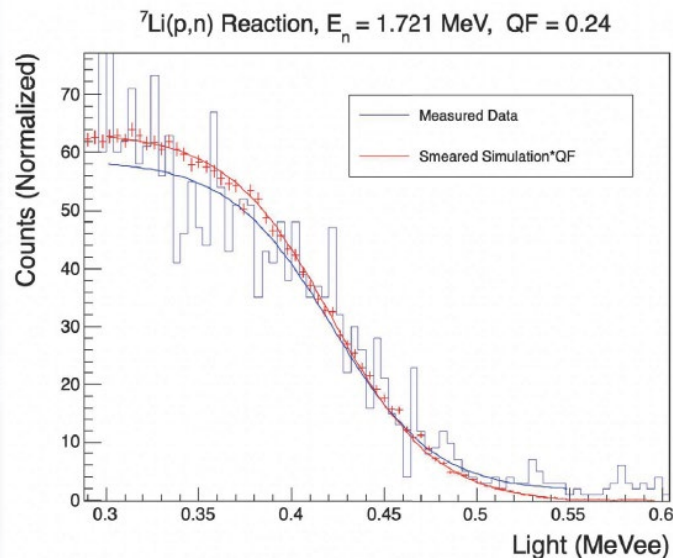


Light response of poly(ethylene 2,6-naphthalate) to neutrons



Low-background active materials are needed for ton-scale, rare-event and cryogenic detectors. Poly(ethylene-2,6-naphthalate) (PEN) is a good candidate for these applications because of its robust structural characteristics and its scintillation light in the blue wavelength region. We present a measurement of PEN's quenching factor using three different neutron sources;



from spontaneous fission in ${}^{252}\text{Cf}$, from a DD generator and from the ${}^{13}\text{C}(\alpha,n){}^{16}\text{O}$ and ${}^7\text{Li}(p,n){}^7\text{Be}$ reactions. The Birks' factor and scintillation efficiency were found to be $k_B = 0.12 \pm 0.01$ mm MeV $^{-1}$ and $S = 1.31 \pm 0.09$ MeVee MeV $^{-1}$ from a simultaneous analysis of the data obtained from the three different sources. With these parameters, it is possible to evaluate PEN as a viable material for large-scale, low background physics experiments.

