PSD status

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Correction independent on input information

- f_{EM} , a, and PE number n
 - $E_{dep} = aE_{had} + E_{input} \Rightarrow E_{input} = E_{dep} aE_{dep}(1 f_{EM})$
 - $n_{corr} = n(1 a(1 f_{EM}))$
 - *a* is extracted from the correlation fit of *n* and *n*_{had}, shared between different energy points.
 - Correlations checked independently in energies => consistent among energies









Rough comparison (very very very preliminary)

Since the distribution for raw n_{PE} can be described by Gaussian. So:

- For corrected n_{PE} : σ and E are from fit
- For raw n_{PE} : σ and E are the standard deviation and mean of the distribution

The \sqrt{E} is taken from the input energy





Remove the 9 GeV point...

- Similar resolution result but better fit quality.
- The resolution improvement is calculated based on the all energy points
- ~13% resolution improvement



What's next?

- Having a separate time shape for proton and neutron
 - Implemented in the simulation

	Fast (us)	Slow (us)
γ	0.070(6%)	0.360(94%)
α	0.046(12%)	0.360(88%)
Proton	0.046(9%)	0.360(91%)

- Consider a smaller geometry (shorter in z)
 - Generating position information of scintillating photons are saved, can check the performance with a cut on z (x, y are available as well)
 - A possible combination with dual readout HCal?
 - f_{EM} from ECal + n from ECal & HCal