

Ecal barrel and endcap overlapping region study at ePIC

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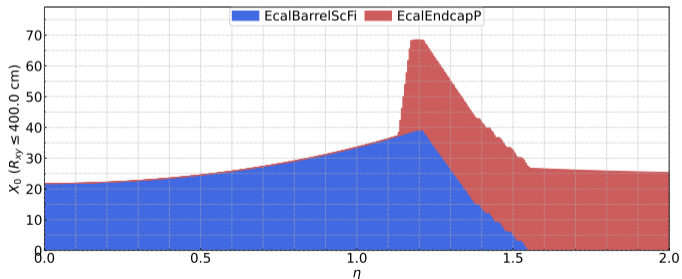
UCLA

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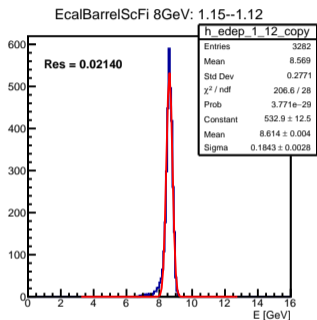
Barrel and endcap overlap material scan

Component	Length	Inner R	Outer R	Start	End
Barrel ECal	498	79	133	-299	199
Forward ECal	30	14	195	330	360

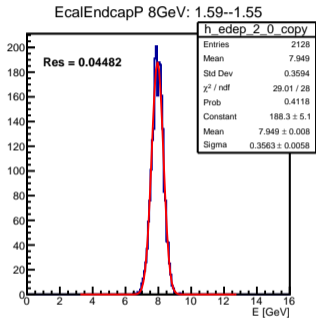
Table from [here](#). The DD4hep and the following material scan use a slightly larger size of fEcal for checks. This table has fEcal coverage up to $\eta = 1.3$.



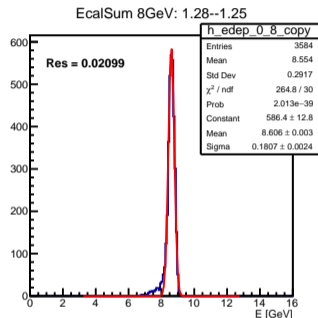
Single photon responses in the overlapping region



EcalBarrelScFi



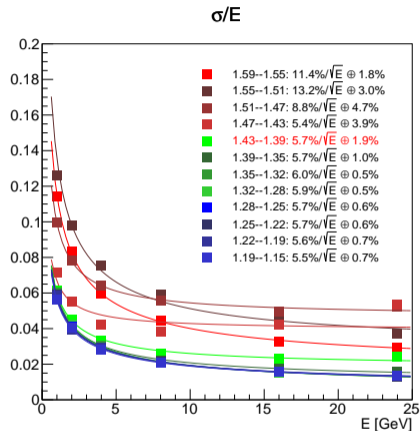
EcalEndcapP



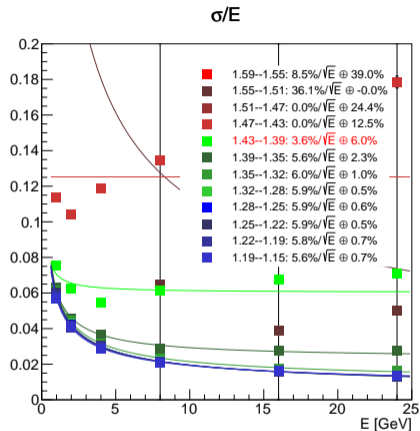
Sum of barrel and endcap

Examples of fittings for one p_T and one η

Single photon resolutions in the overlapping region



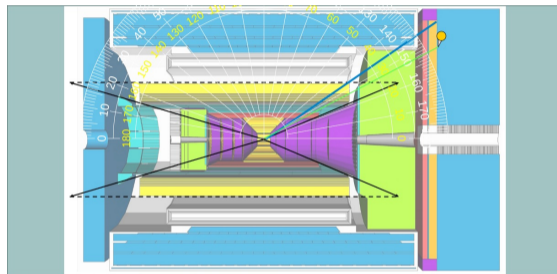
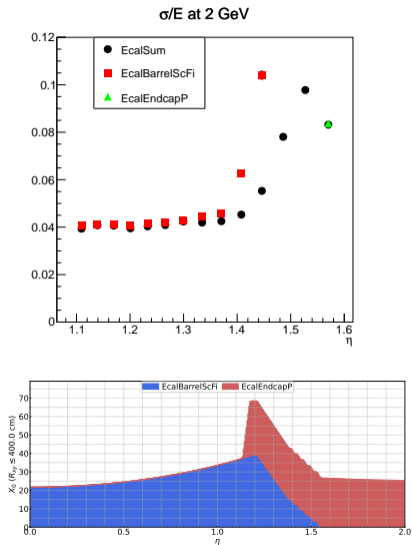
Sum of barrel and endcap



Only EcalBarrelScFi

Starting and above the red line, the barrel Ecal does not have good resolutions and we need the fEcal.

Single photon resolutions vs η at 2 GeV



The green line corresponds to $\eta = 1.4$. For $\eta < 1.4$, the barrel Ecal dominates the resolutions. Only for $\eta > 1.4$, we need the fEcal.

- For current geometry of barrel Ecal, we don't need fEcal coverage below rapidity 1.4.
- This translates to outer radius of fEcal of ~ 173 cm and total number of readout channels ~ 15 k (instead of ~ 19 k as in latest design).
- If length or radius of barrel Ecal will change, we need to repeat same exercise again.