

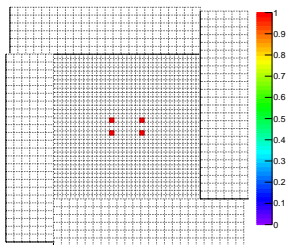
θ resolution and HyCal reconstruction

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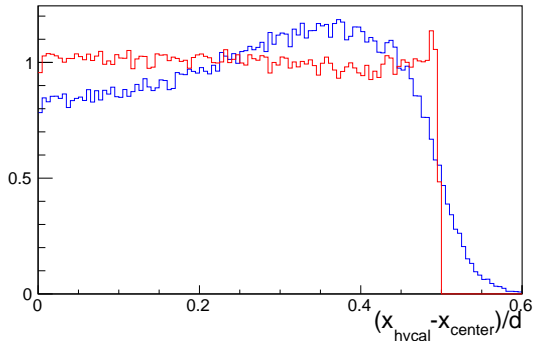
- ▶ Method and functions taken from A. A. Lednev, NIM Physics Research A 366 (1995) 292-297
- ▶ correction of reconstruction on the variable $x_0 = (x_{rec} - x_{center}) / size_{cell}$
- ▶ corrected variable $x = x_0 + c(x_0)$
- ▶ summation of 4 symmetrical modules to cancel out the physical distribution shape both in x and y coordinates

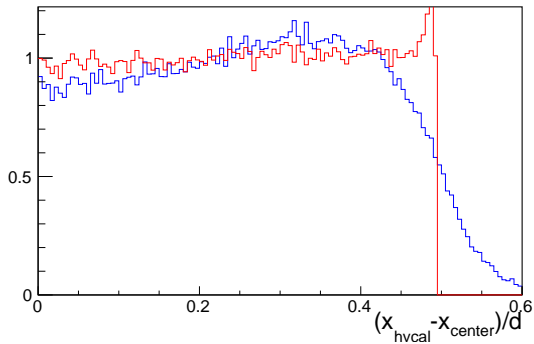


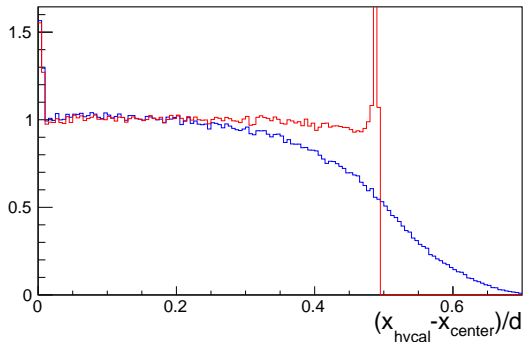
$$c(x_0) = a \cdot x_0 \cdot (x_0^4 + b \cdot x_0^2 + c) \cdot (x_0^2 - 1/4) \cdot (x_0^2 - q) \quad (1)$$

- ▶ density function: $f_{X_0}(x_0) = 1 + c'(x_0)$
- ▶ Fit raw density function between 0 and 1/2 with: $1 + c'(x_0)$
- ▶ Rough table for 2 GeV:

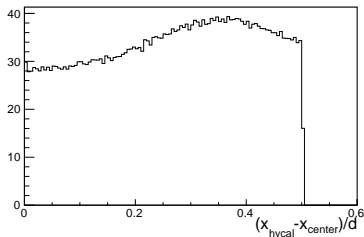
	$1500 < E$	$500 < E < 1500$	$100 < E < 500$
a	-40	-30	-0.5
b	0.3	0.07	0.3
c	0.1	0.1	0.2
q	0.15	0.08	-4



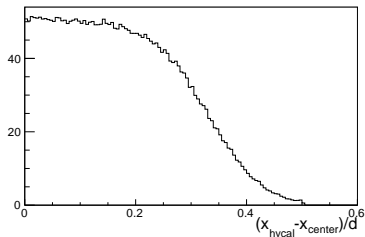




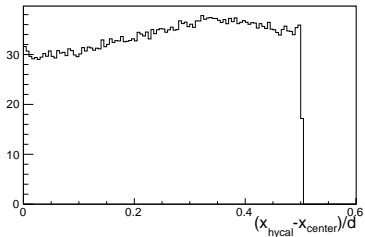
4.2



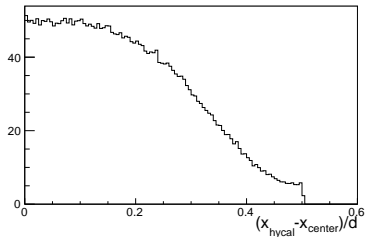
6.0



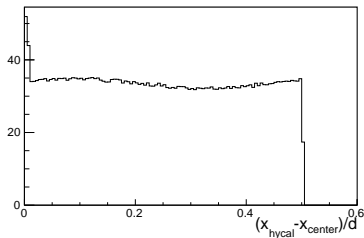
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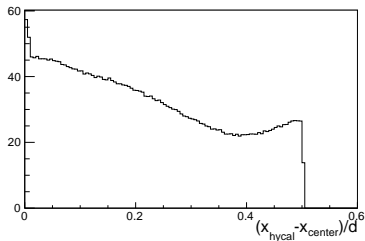
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4.2



6.0



- ▶ Change minimum module energy (might take long reconstruction)
- ▶ Solve the edge problem at the edge for lower energy (Probably just need ID reassignment)
- ▶ More refined binning for E (more statistics)
- ▶ Binning on theta, and closer look at transition and edges
- ▶ Do it for 1 GeV and simulation