

Tuning And Validation at 4.26 GeV

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Motivation

- We use the data taken at 4.26 GeV to optimize parameters of the Generator
- To get the parameters by simultaneously fitting to data distributions
- Models of fit to the experimental data

(1) Parameter vector: $\vec{p} = \vec{p}_0 + \delta\vec{p}$

(2) Observable: x

(3) Quadratic approximation:

$$f(\vec{p}_0 + \delta\vec{p}, x) = a_0^{(0)}(x) + \sum_{i=1}^n a_i^{(1)}(x) \delta\vec{p}_i + \sum_{i=1}^n \sum_{j=1}^n a_{ij}^{(2)}(x) \delta\vec{p}_i \delta\vec{p}_j$$
$$\approx MC(\vec{p}_0 + \delta\vec{p}, x)$$

We choose $n = 12$, thus, 91 equations are needed to solve the equation bellow and we will produce 91 MCs to get the parameters.

Data Sets and MC

- Data Sets

Ecms: 4.26GeV

RunNo: 34661~34665

Luminosity: 4.3 pb^{-1}

- MC

Ecms: 4.26GeV

RunNo: 34661~34665

Ranges of 12 parameters: Shown as table (Obtained randomly each time)

Parameter	Range	Parameter	Range
PARJ(11)	0~1	PARJ(1)	0~1
PARJ(12)	0~1	PARJ(2)	0~1
PARJ(14)	0~1	PARJ(21)	0~1
PARJ(15)	0~1	RALPA(67)	-1~1
PARJ(16)	0~1	RALPA(16)	-1~1
PARJ(17)	0~1	RALPA(17)	-1~1


Generator and Decay Card

- Version : BesEvtGen-00-03-84
- Framework : ConExc + PHOKHARA + LUARLW
 - 1) Events generated by the PHOKHARA model are explicitly specified in the user decay cards for the exclusive process
 - 2) When ConExc model with the parameter 74110 is invoked each time, an alternative decay cards, incorporating PHOKHARA model, is automatically write out to a default file with name “_pkhr.dec” in the user work directory

Examples: /besfs/groups/tauqcd/jingmq/reserve/BesEvtGen-00-03-84/decay

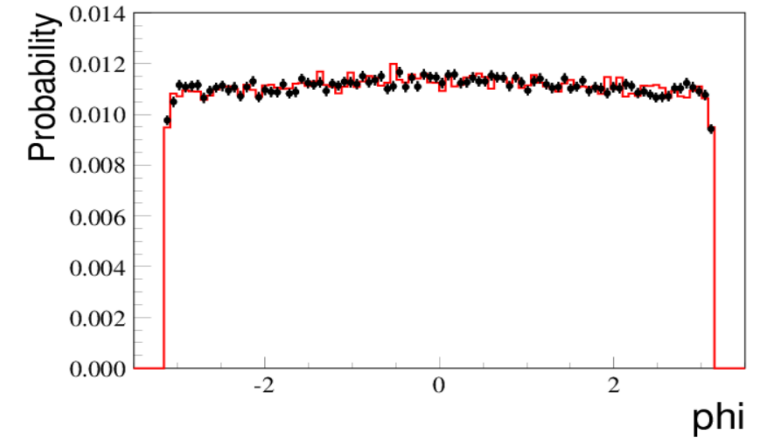
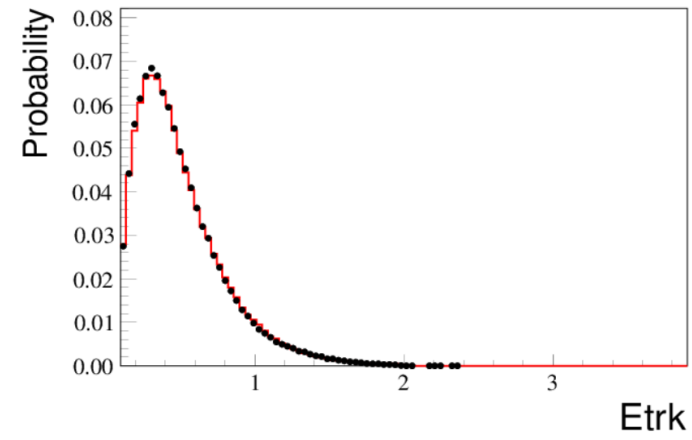
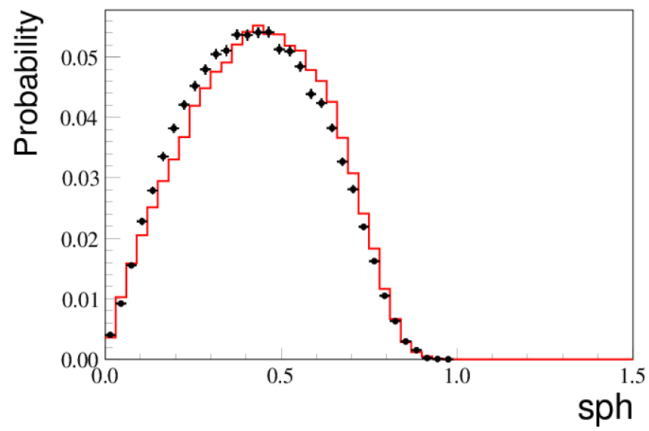
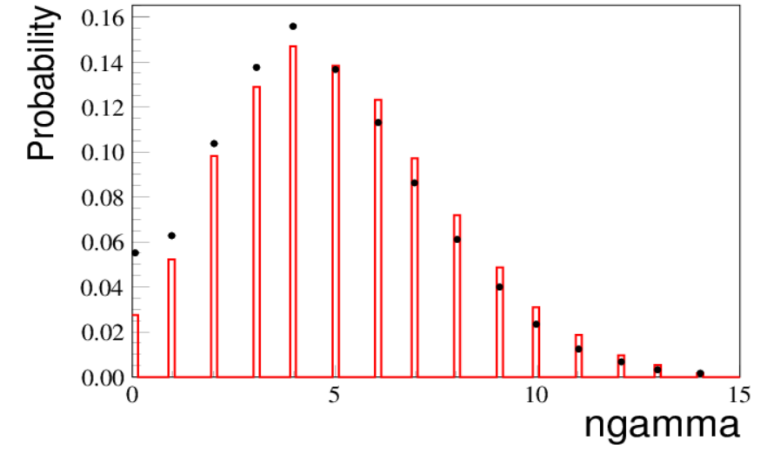
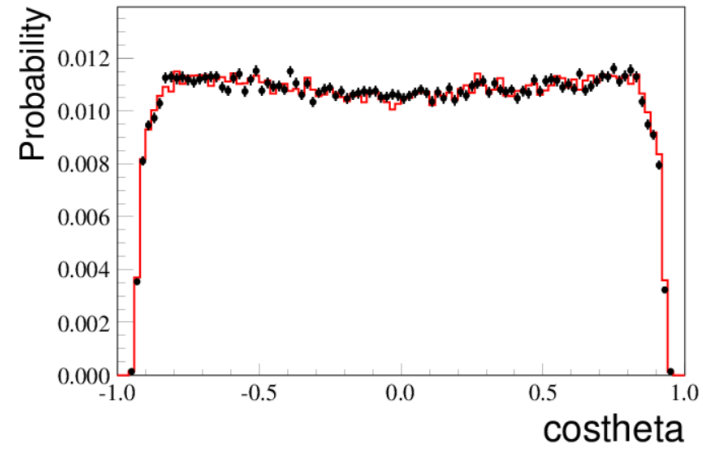
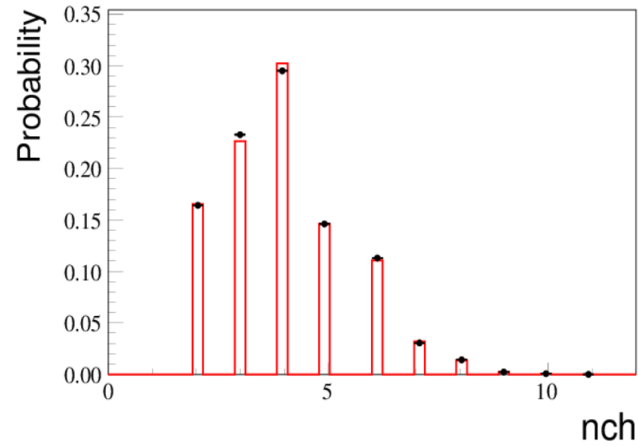
Tuning Results

- Fitting Parameters :
Shown as right table
- Fitting Distributions :
Shown as page 5

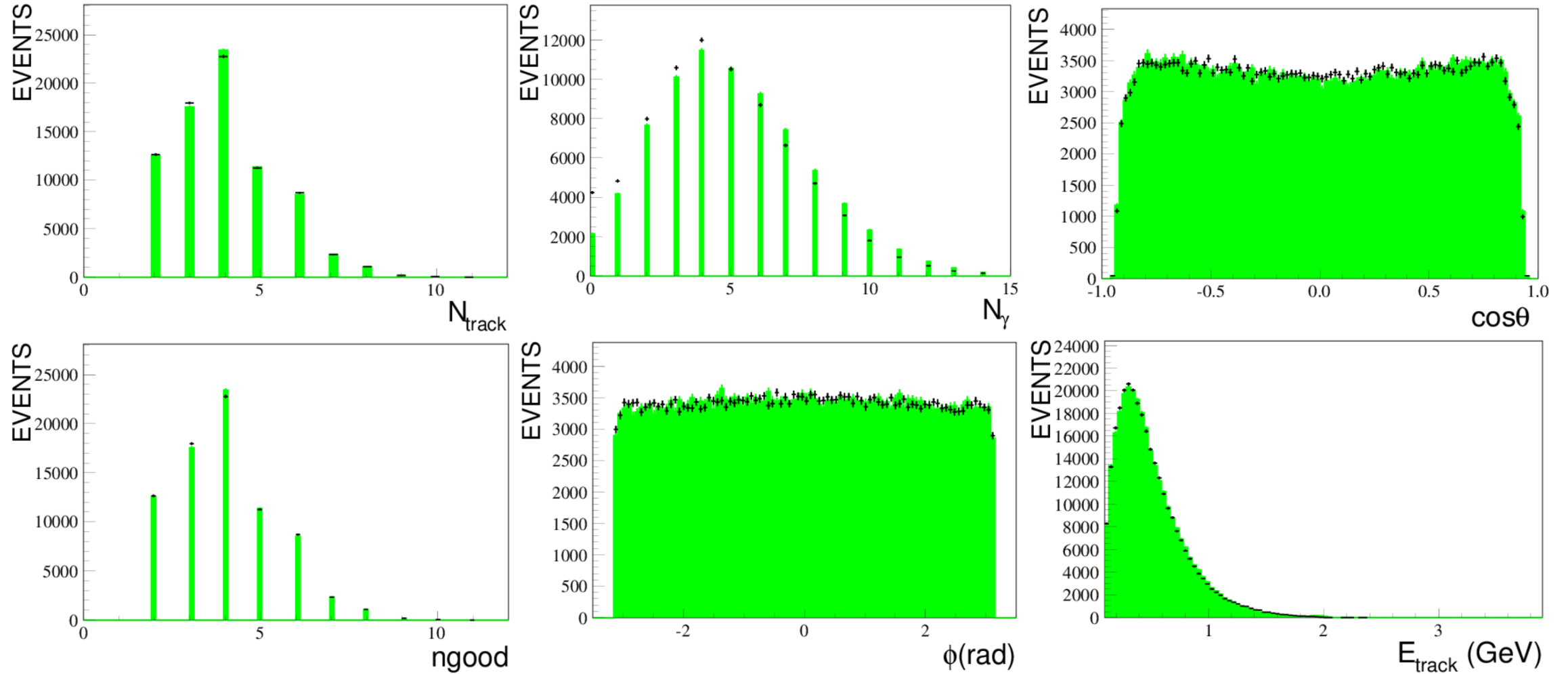


Parameter	Value	Parameter	Value
PARJ(11)	0.418726	PARJ(1)	0.449046
PARJ(12)	0.851125	PARJ(2)	0.545369
PARJ(14)	0.54183	PARJ(21)	0.250755
PARJ(15)	0.341558	RALPA(67)	0.353249
PARJ(16)	0.617259	RALPA(16)	-0.577024
PARJ(17)	0.288212	RALPA(17)	-0.694996

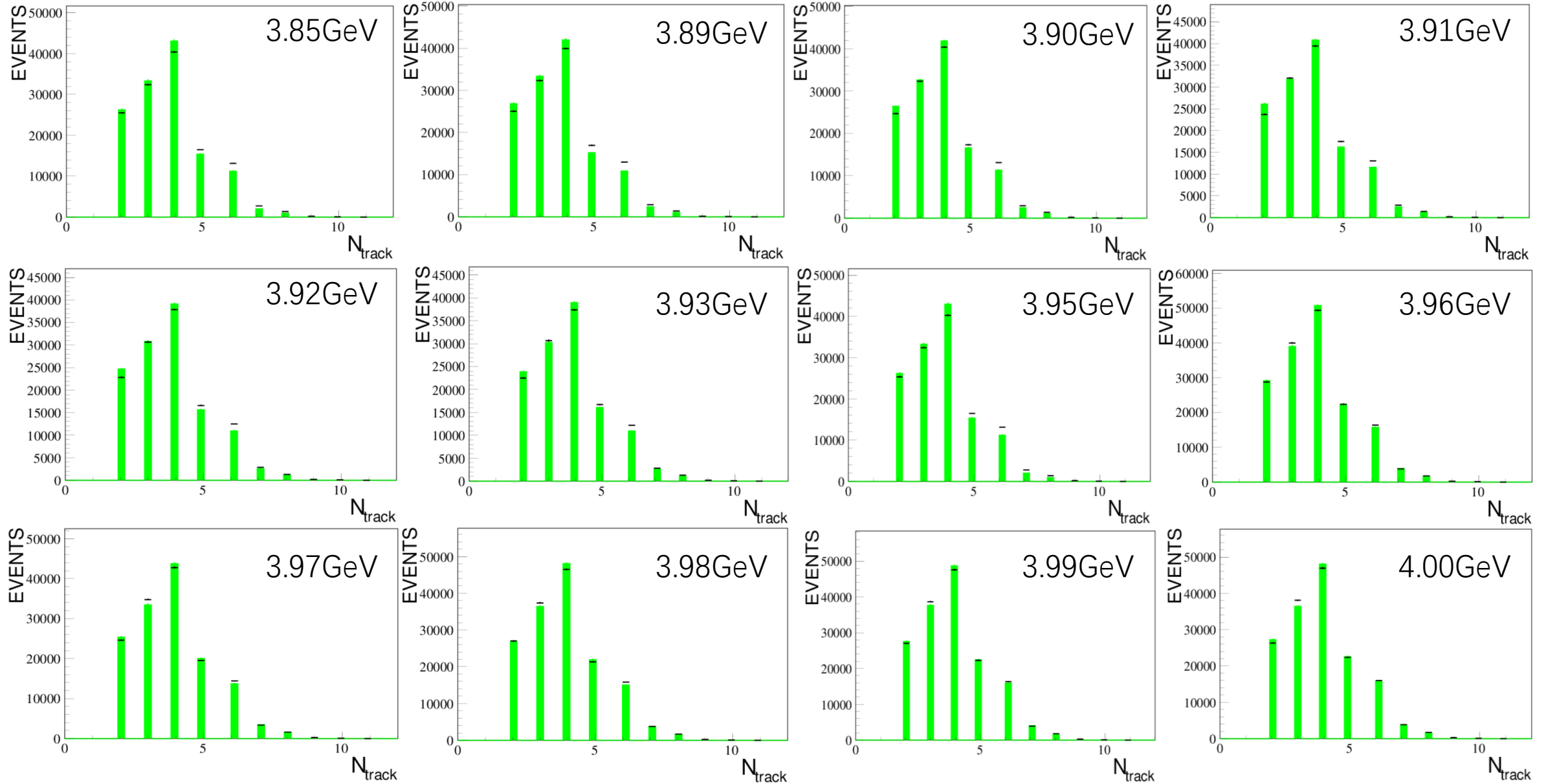
Tuning Results



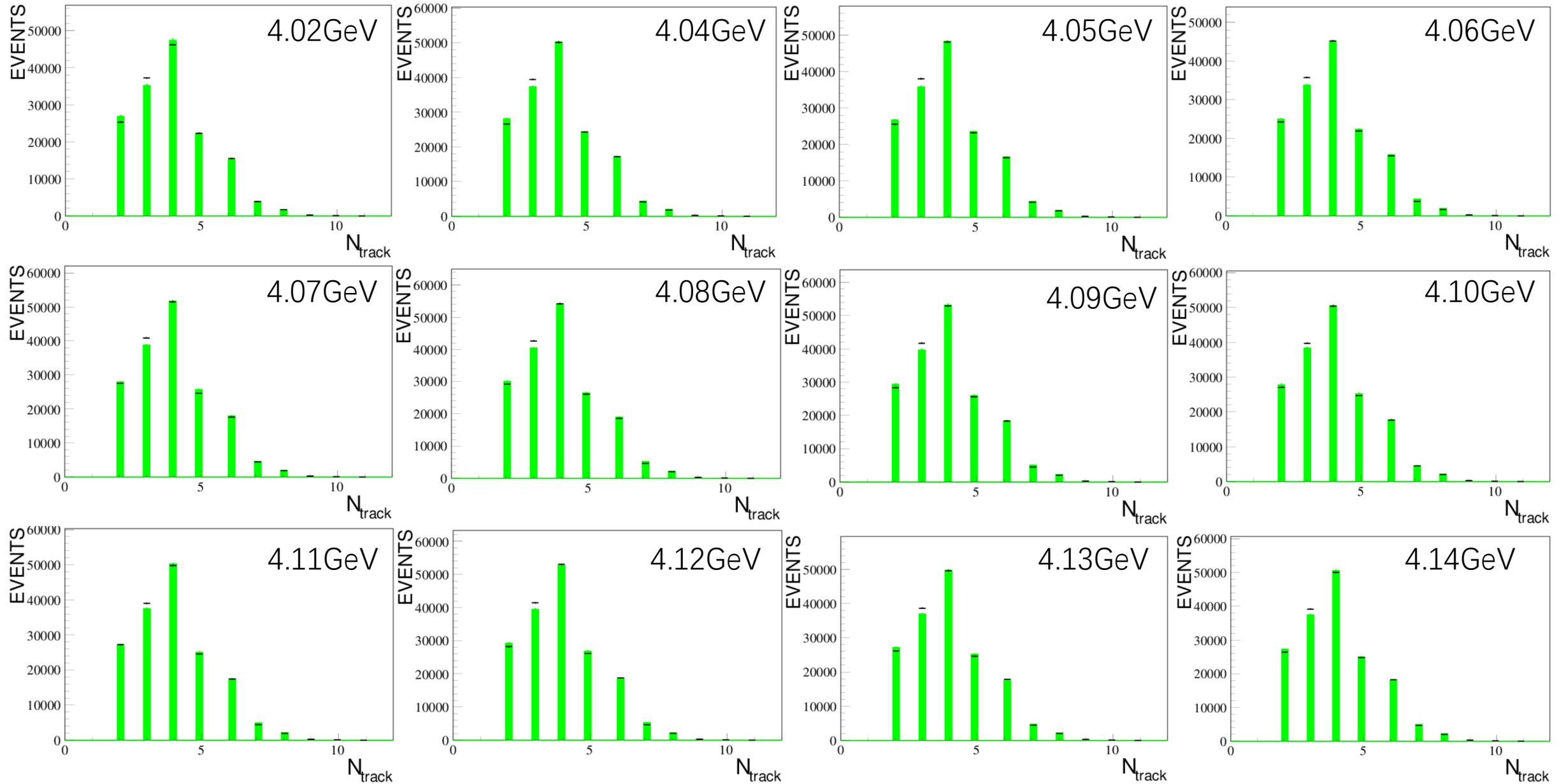
Validation at 4.26 GeV



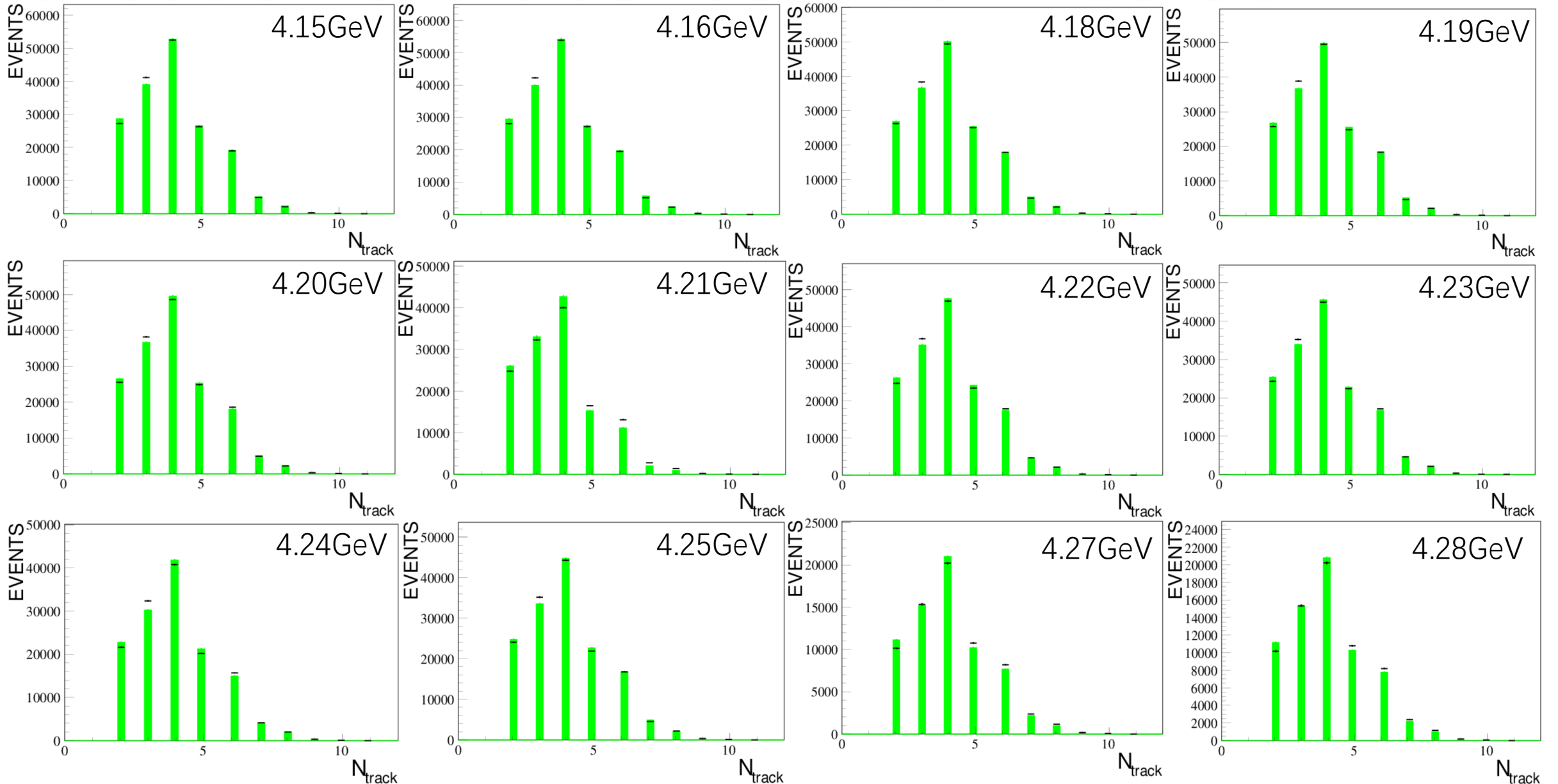
Validation of Ntrack at 3.85~4.00 GeV



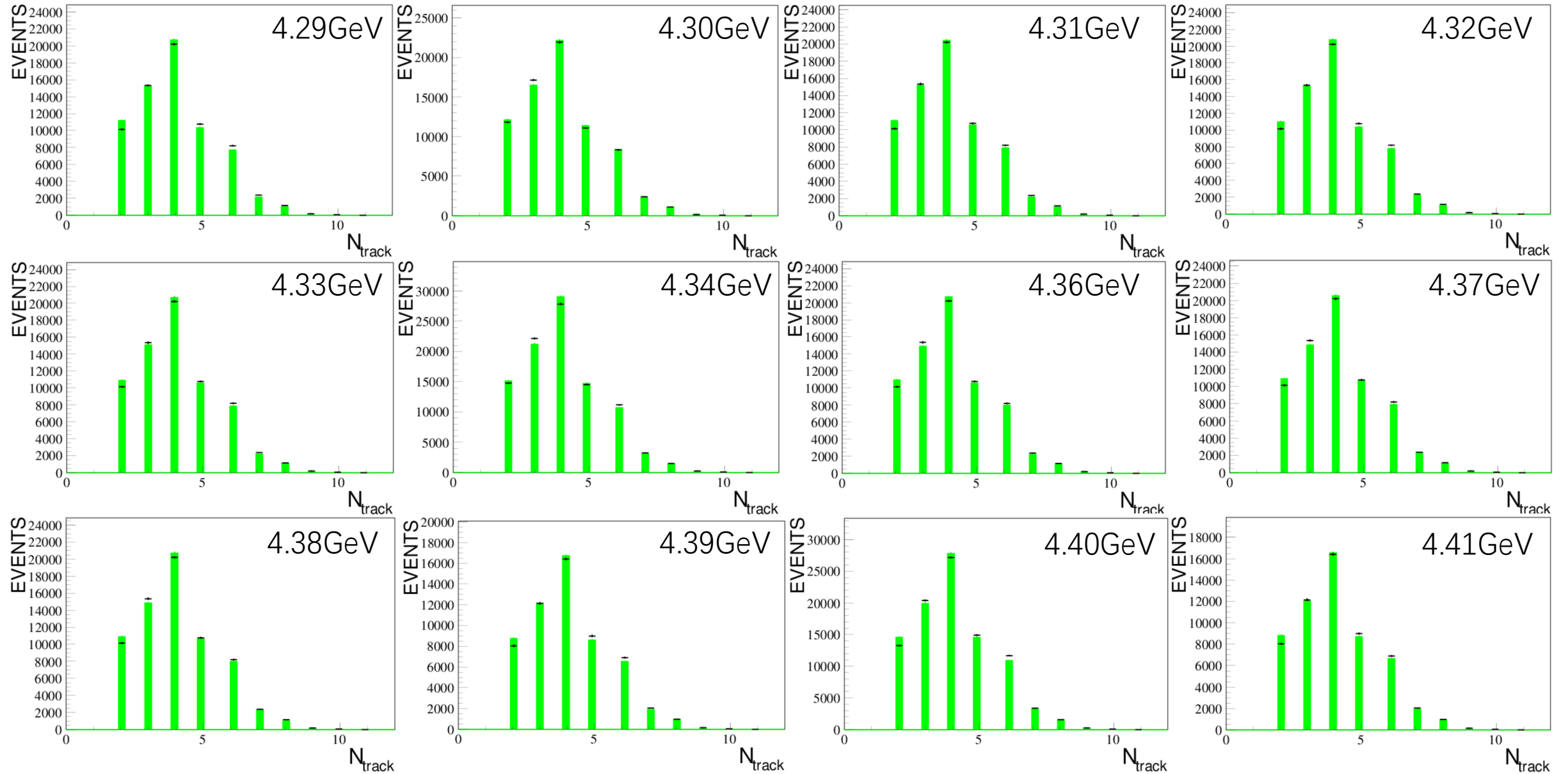
Validation of Ntrack at 4.02~4.14 GeV



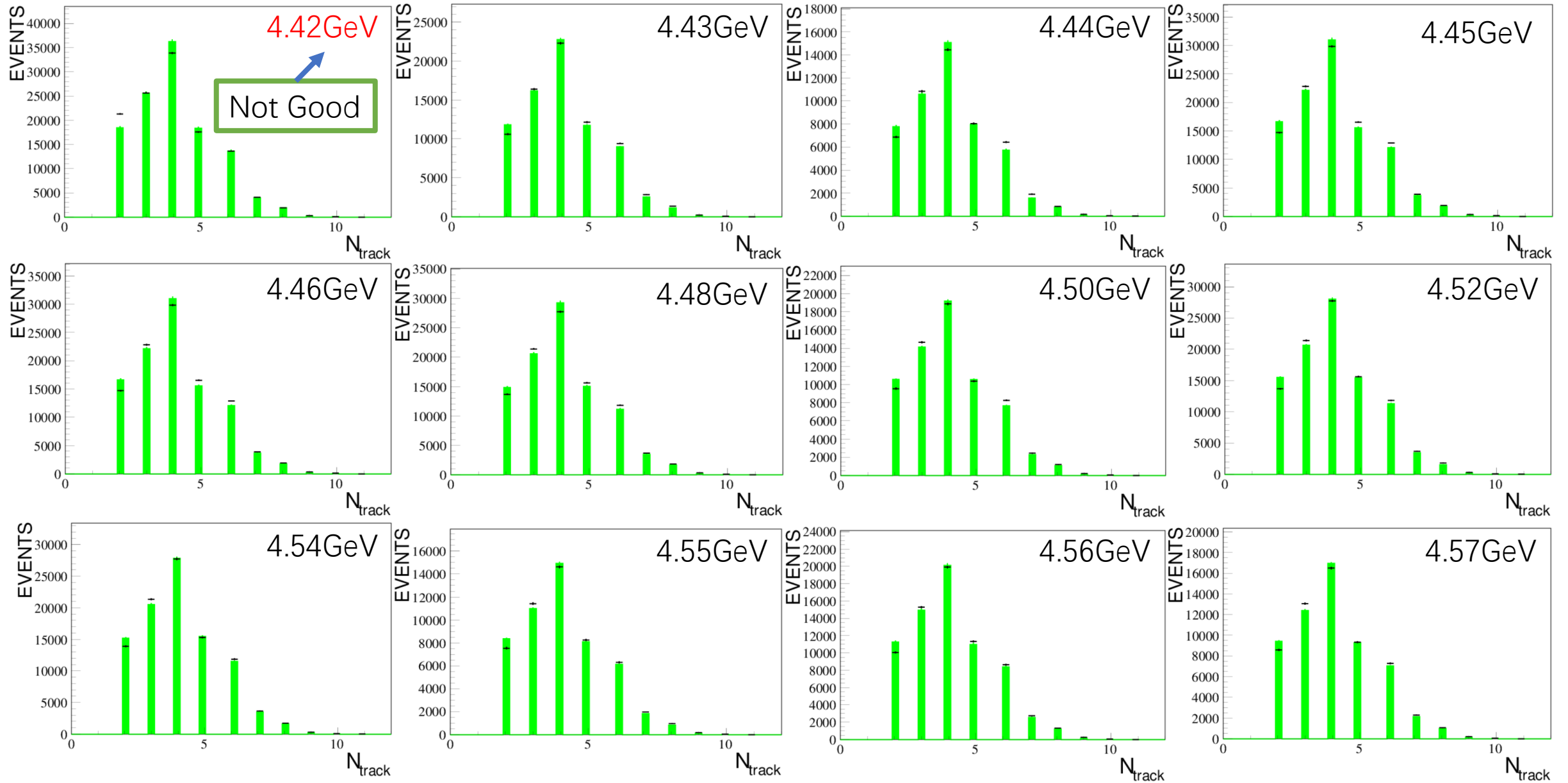
Validation of Ntrack at 4.15~4.28 GeV



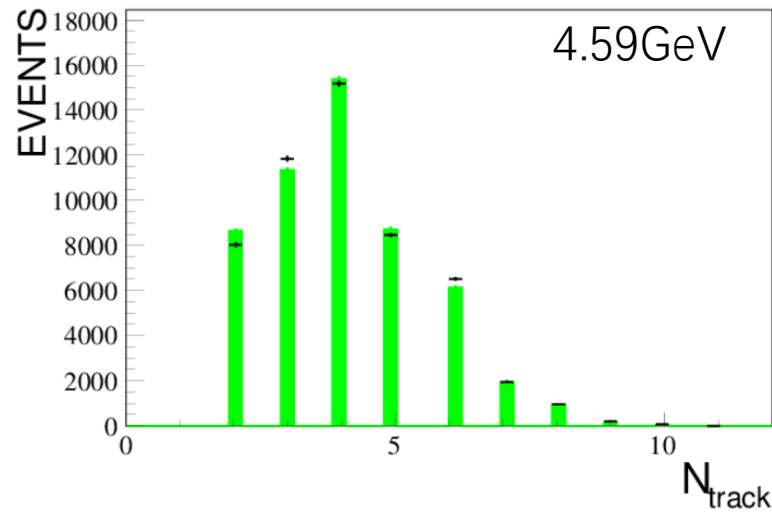
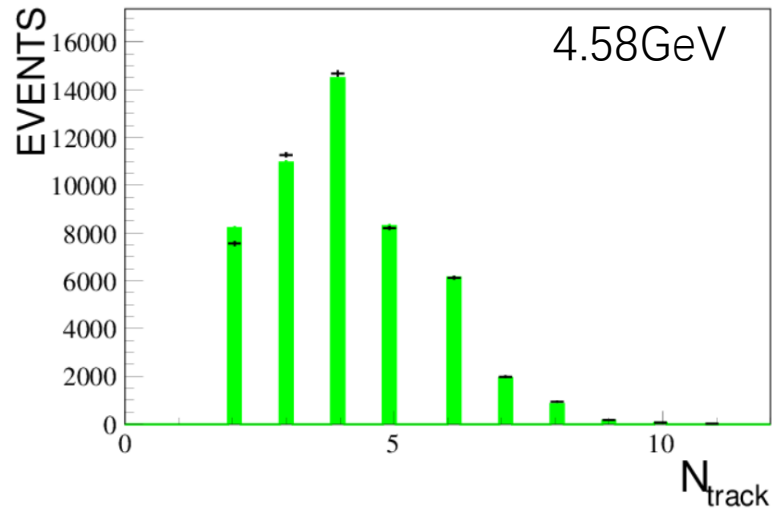
Validation of Ntrack at 4.29~4.41 GeV



Validation of Ntrack at 4.42~4.57 GeV



Validation of Ntrack at 4.58~4.59 GeV



Other distributions show that MC and data agree well with each other except N_{γ} (relatively good but not excellent) and sph (sphericity).

All ps files are available in:
/besfs/groups/tauqcd/jingmq/reserve/BesEv
tGen-00-03-84/ps

All decay cards are available in:
/besfs/groups/tauqcd/jingmq/reserve/BesEv
tGen-00-03-84/decay

Thank you!