The center-of-mass energy spectra in simulation

Weiping Wang[1a], Zhen Gao[1], Bingxin Zhang[2], Lipeng Zhou[2],
Ronggang Ping[2], Wenbiao Yan[1], Haiming Hu[2], Guangshun Huang[1], Zhengguo Zhao[1]

[1] University of Science and Technology of China, Anhui, China
[2] Institute of High Energy Physics, CAS, Beijing, China

(Dated: January 30, 2019)

[a] Email: cloud13@mail.ustc.edu.cn

CONTENTS

I. THE DISTRIBUTION OF $E_{\rm c.m.}$ IN LUARLW SIMULATION

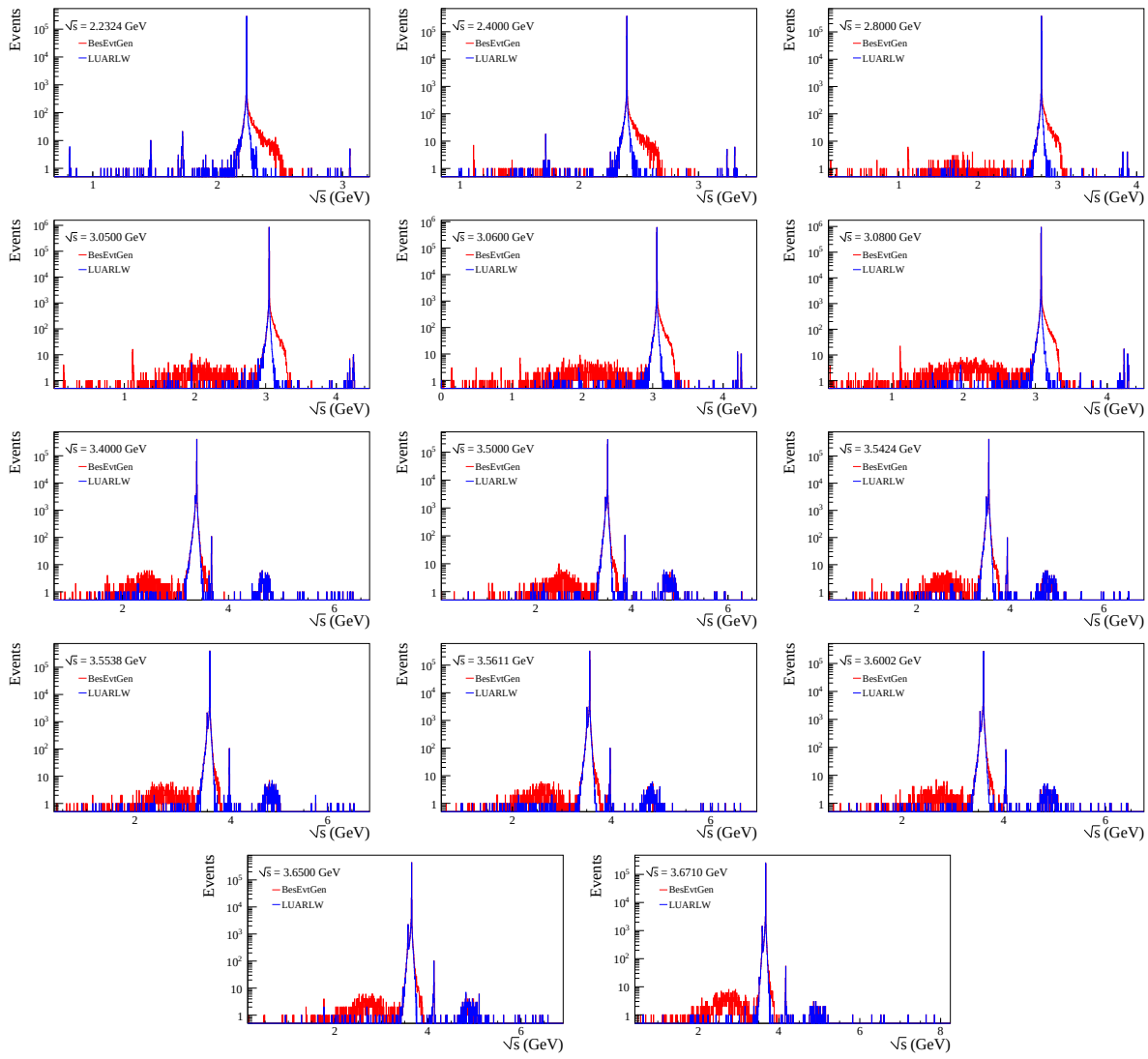

FIG. 1. The full-range comparisons of $E_{\rm c.m.}$ between LUARLW (20170512) and BesEvtGen.

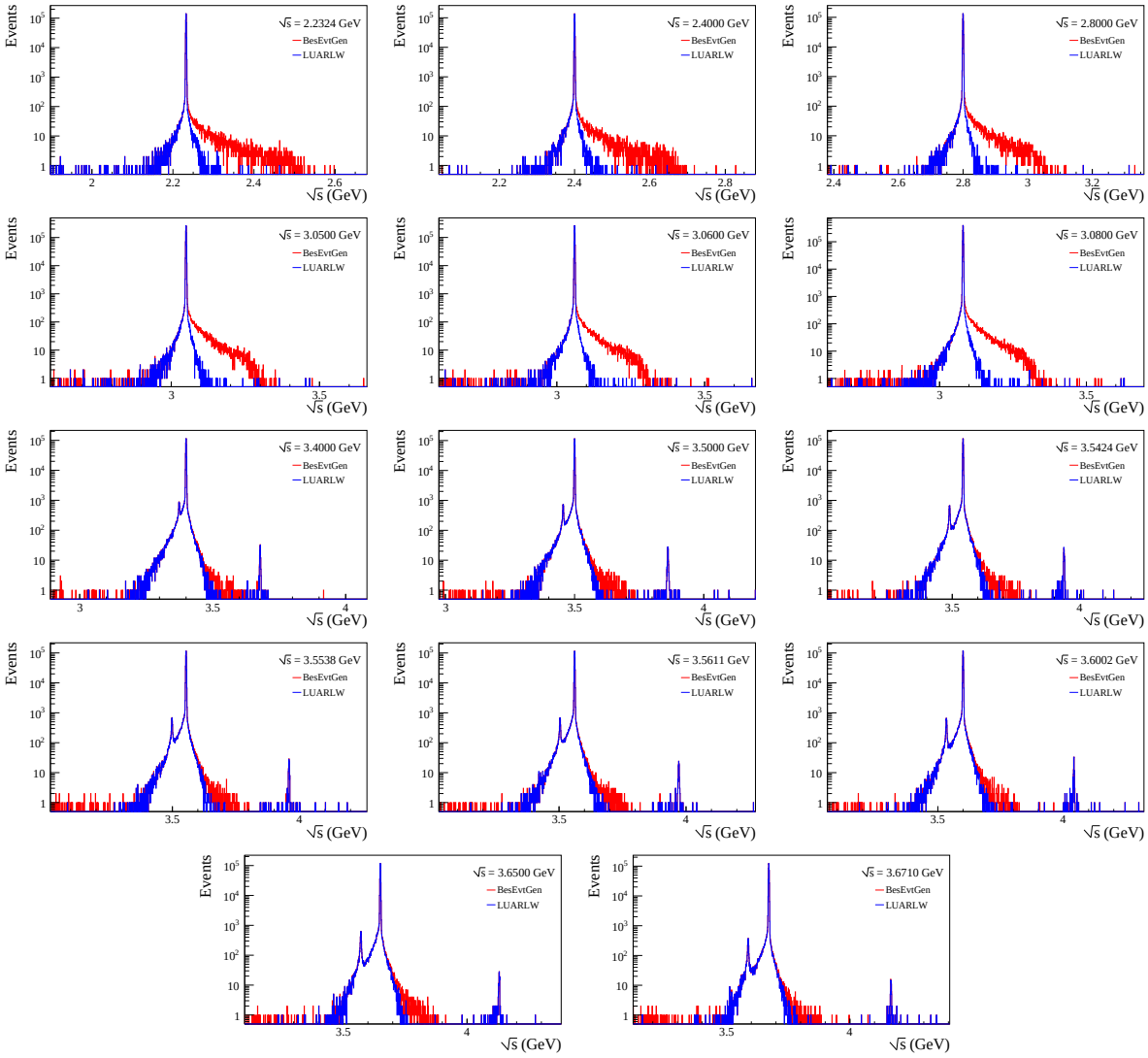

FIG. 2. The detail comparisons of $E_{\text{c.m.}}$ between LUARLW (20170512) and BesEvtGen.

II. THE DISTRIBUTION OF $E_{\rm c.m.}$ IN LATEST LUARLW SIMULATION

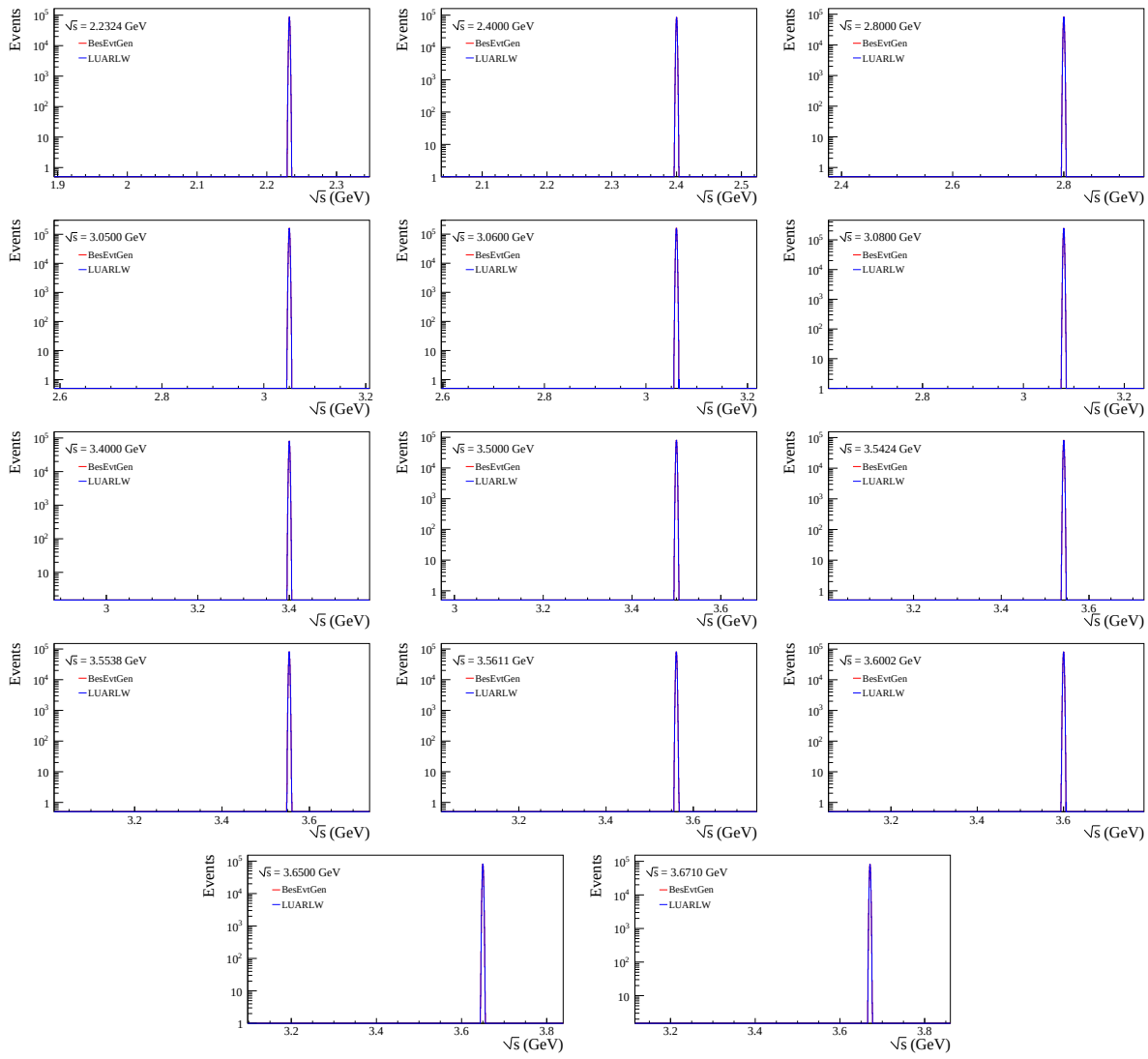

FIG. 3. The full-range comparisons of $E_{\rm c.m.}$ between new LUARLW (20190130) and BesEvtGen.

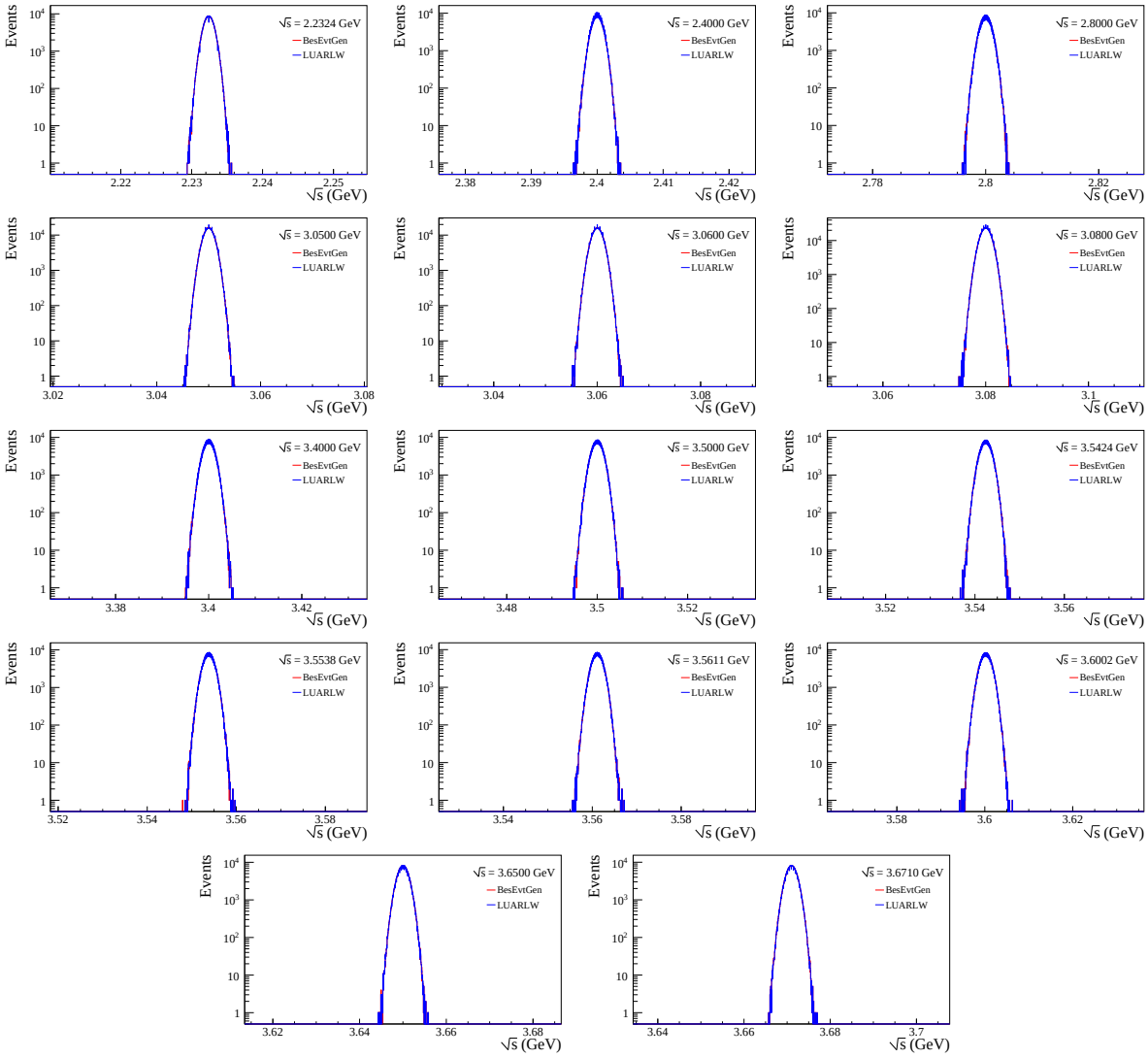

FIG. 4. The detail comparisons of $E_{\mathrm{c.m.}}$ between new LUARLW (20190130) and BesEvtGen.

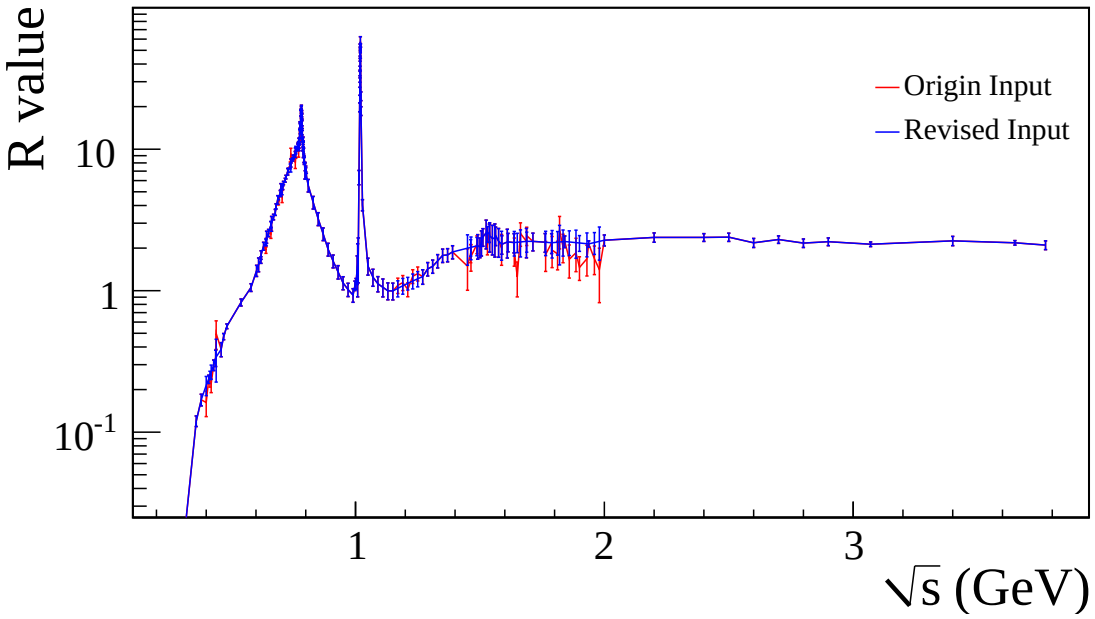

FIG. 5. The input R values for LUARLW model.

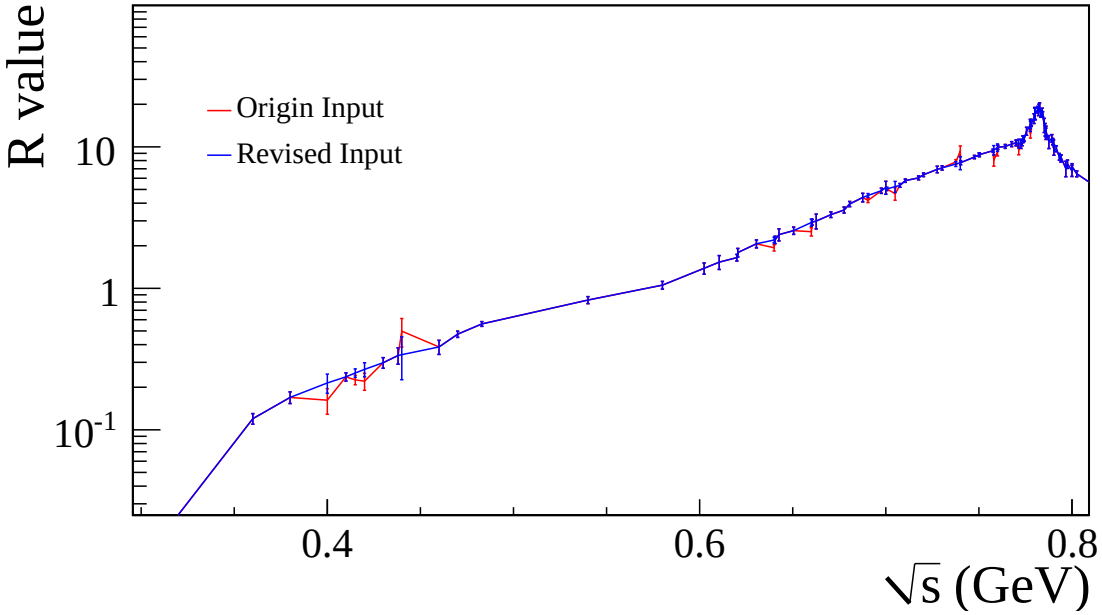

FIG. 6. The input R values (low-end) for LUARLW model.

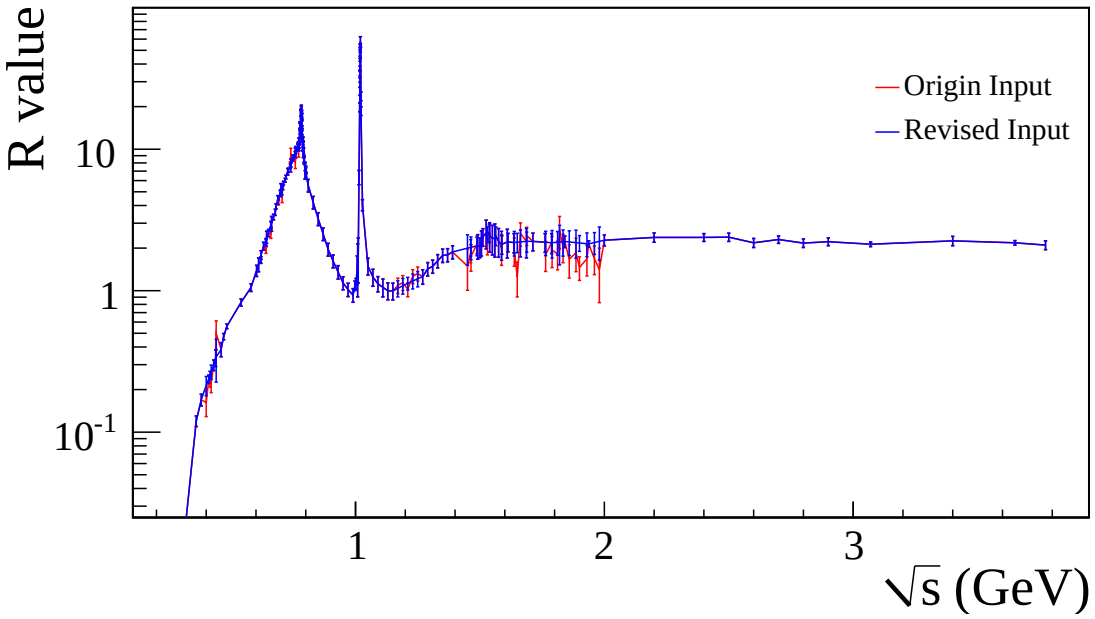

FIG. 7. The input R values for LUARLW model.

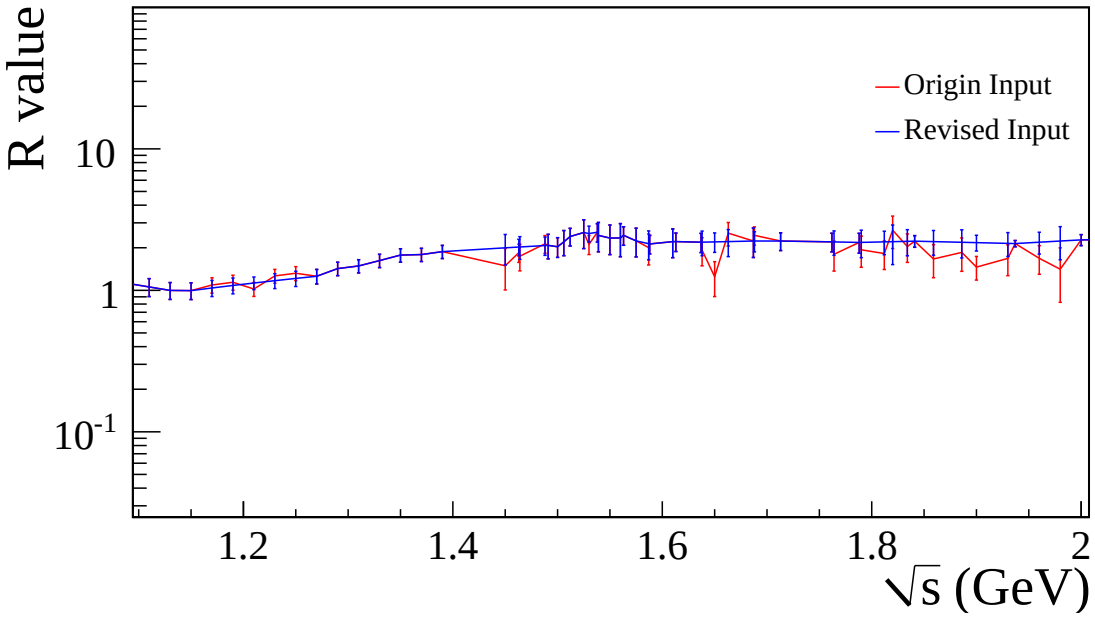

FIG. 8. The input R values (high-end) for LUARLW model.

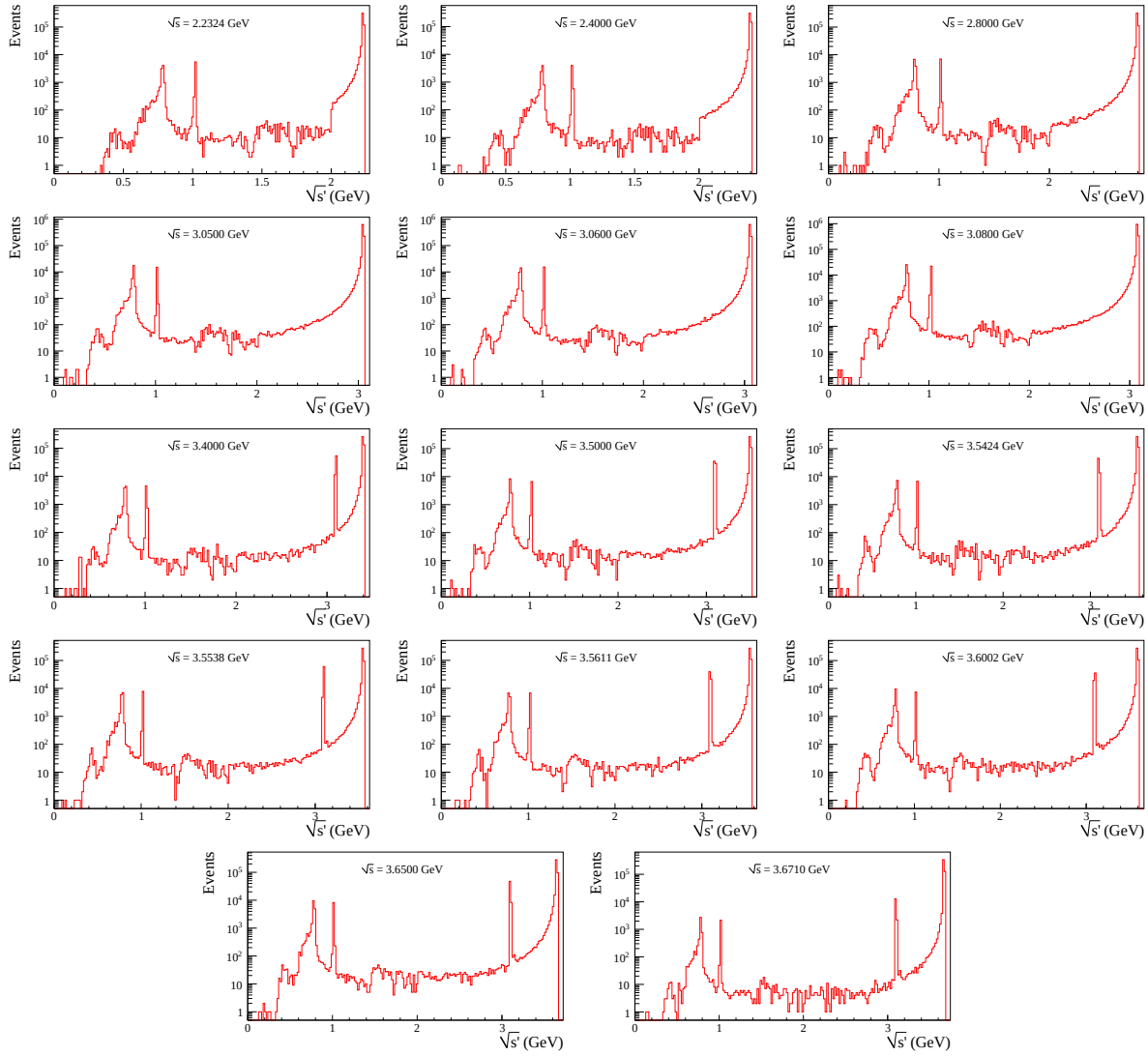

FIG. 9. In LUARLW simulation (20190130), the energy spectra of final states after emitting an ISR photon. These energy values are read directly at the MC truth level.

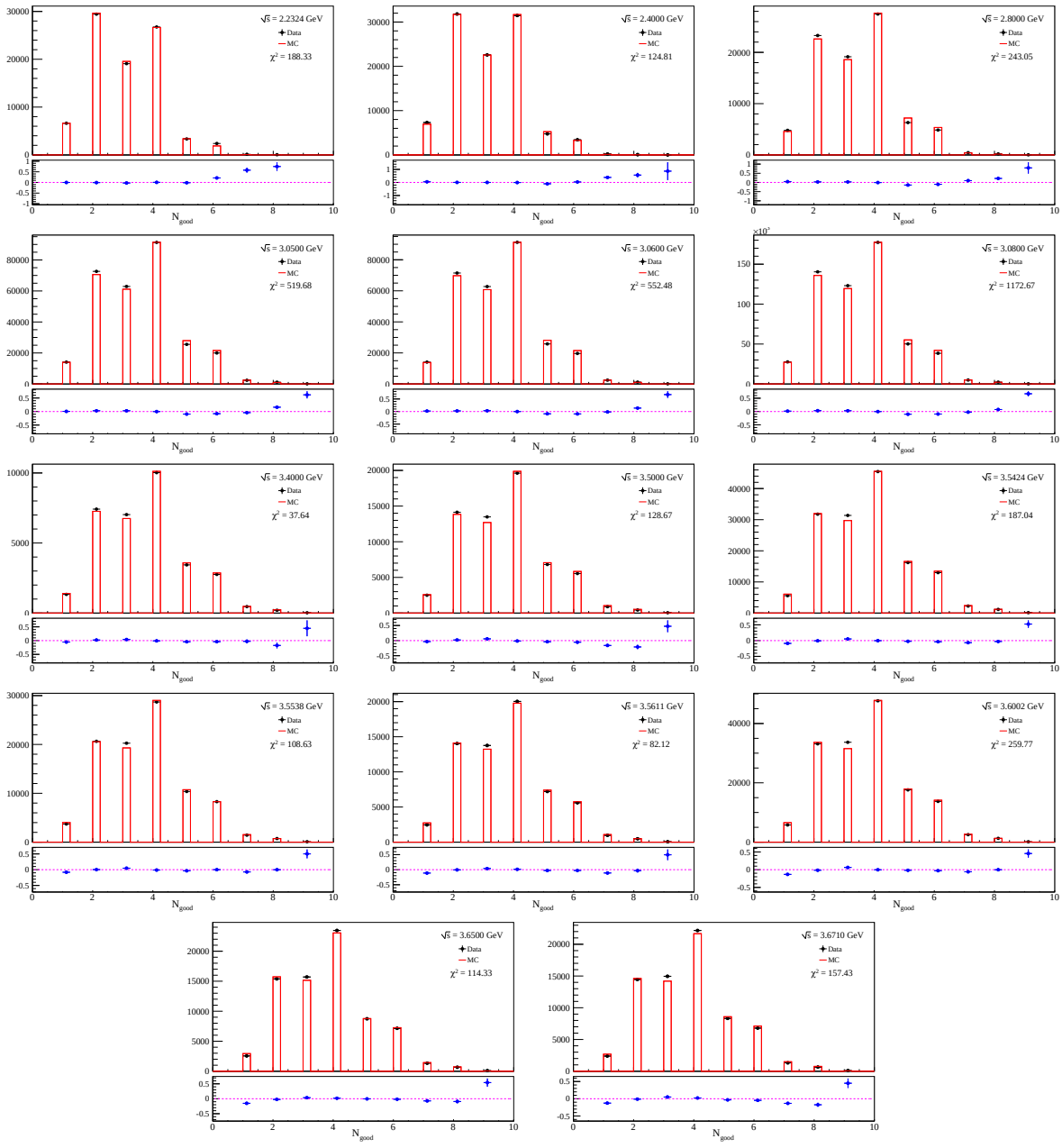

FIG. 10. The detail comparisons of $N_{\rm good}$ between signal MC (20190130) and data.

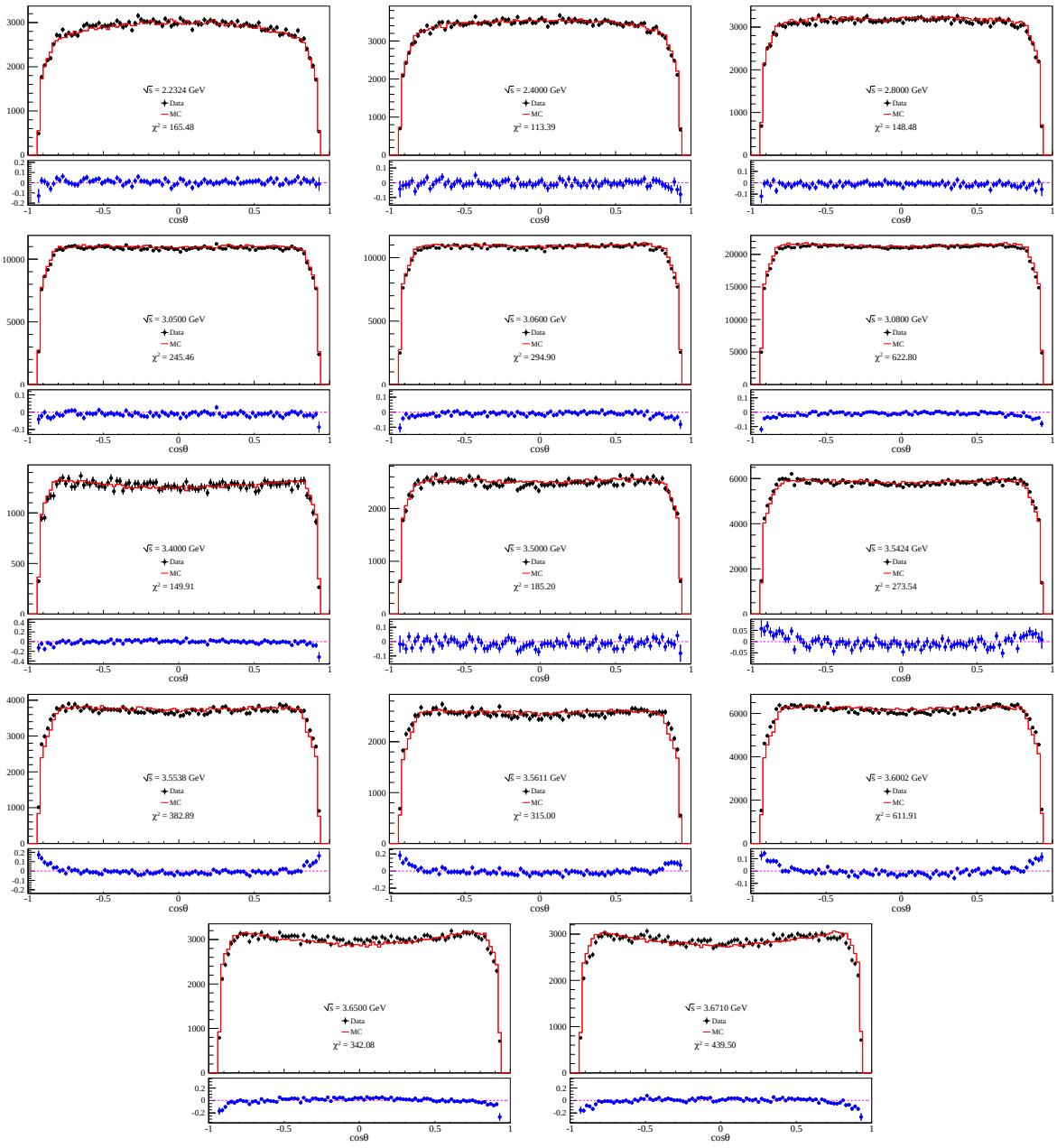

FIG. 11. The detail comparisons of *cosθ* between signal MC (20190130) and data.

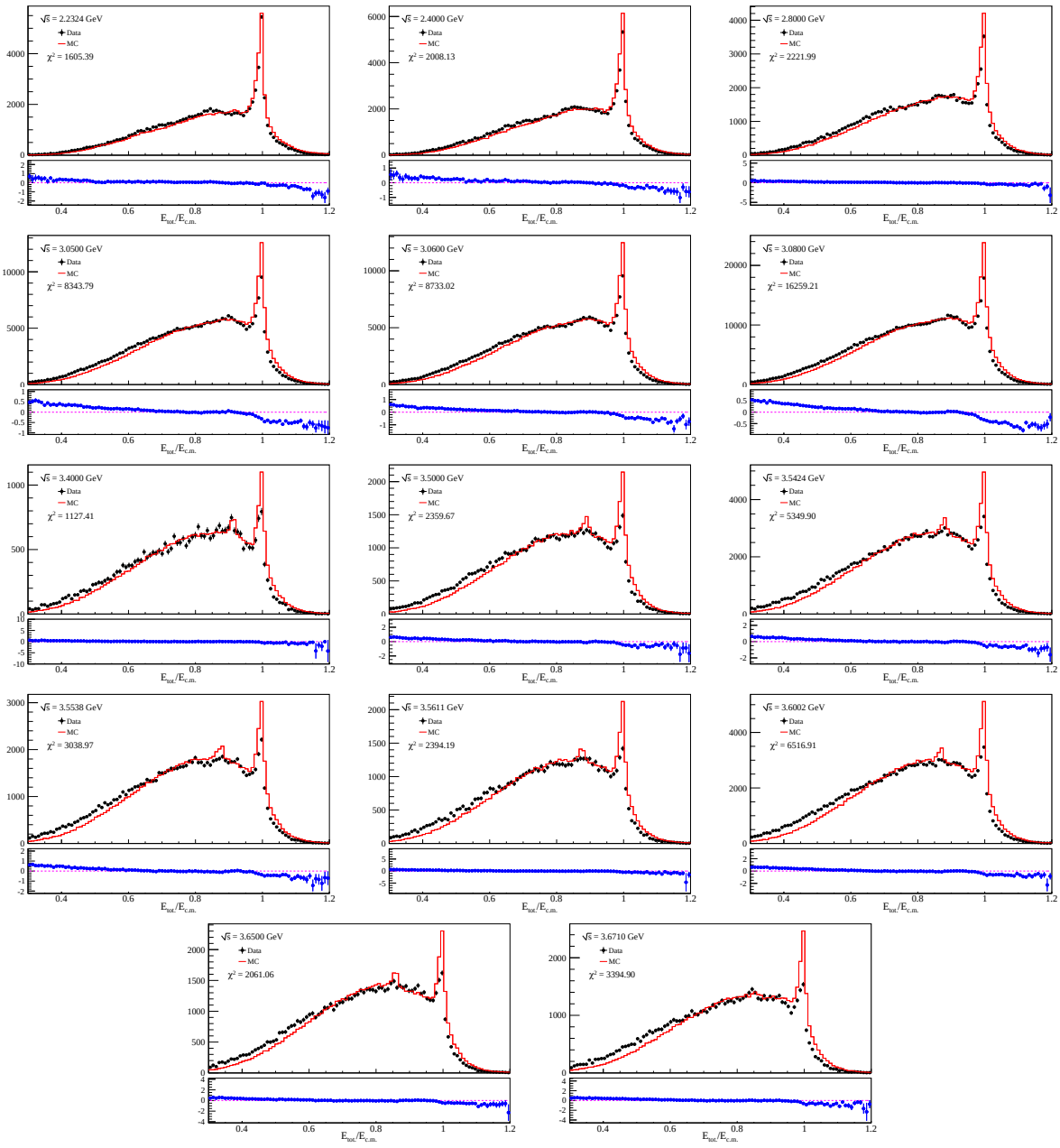

FIG. 12. The detail comparisons of $E_{\rm tot.}$ between signal MC (20190130) and data, where $E_{\rm tot.}$ is the energy detected by MDC and EMC for each event. The charged tracks are regarded as pion when calculating the detected energy in MDC. Only the deposited energy of good photons are included in $E_{\rm tot.}$.

III. COMPARISON OF DETECTION EFFICIENCY BETWEEN TWO SIMULATION ROUNDS

TABLE I. The difference of detection efficiencies between two simulations.

$\sqrt{s}$ (GeV)	$\varepsilon_{\rm had}^{\rm new}$ (%)	$\varepsilon_{\rm had}^{\rm old}$ (%)	$\Delta_{rel.}$ (%)
2.2324	67.84	67.45	0.58
2.4000	71.07	69.47	2.25
2.8000	75.02	72.69	3.10
3.0500	76.44	74.39	2.68
3.0600	76.47	74.50	2.58
3.0800	76.35	74.12	2.92
3.4000	79.22	79.73	-0.64
3.5000	79.45	80.03	-0.72
3.5424	79.61	80.36	-0.94
3.5538	78.59	80.19	-2.04
3.5611	79.11	80.14	-1.30
3.6002	79.11	80.25	-1.44
3.6500	78.44	80.31	-2.38
3.6710	82.57	82.30	0.33