

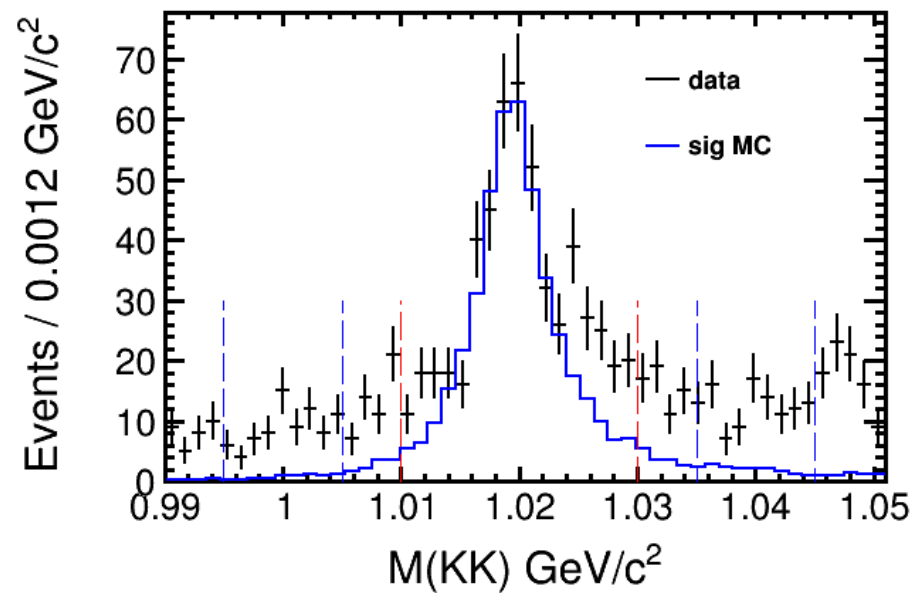
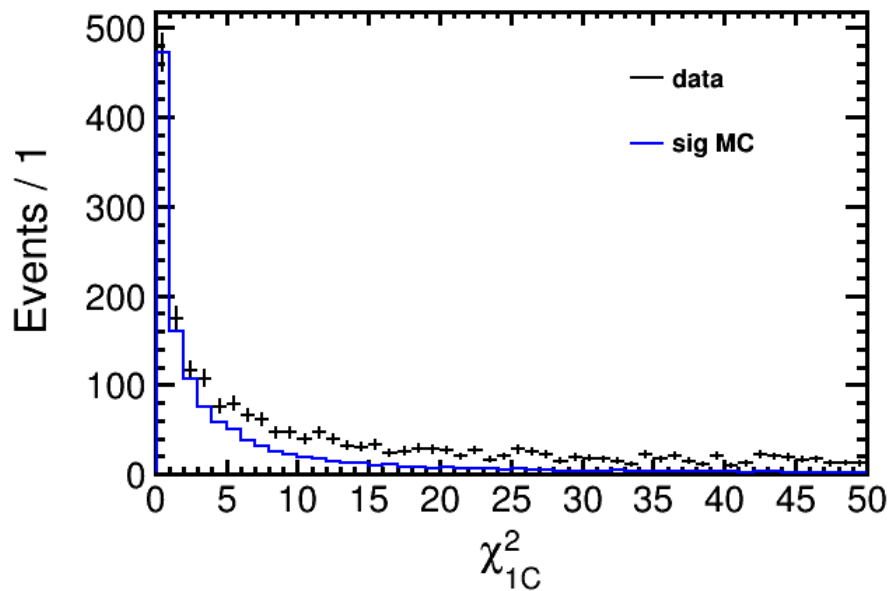
$e^+e^- \rightarrow \phi\Lambda\bar{\Lambda}$ with XYZ data

Junhao Yin, Ke Li, Changzheng Yuan

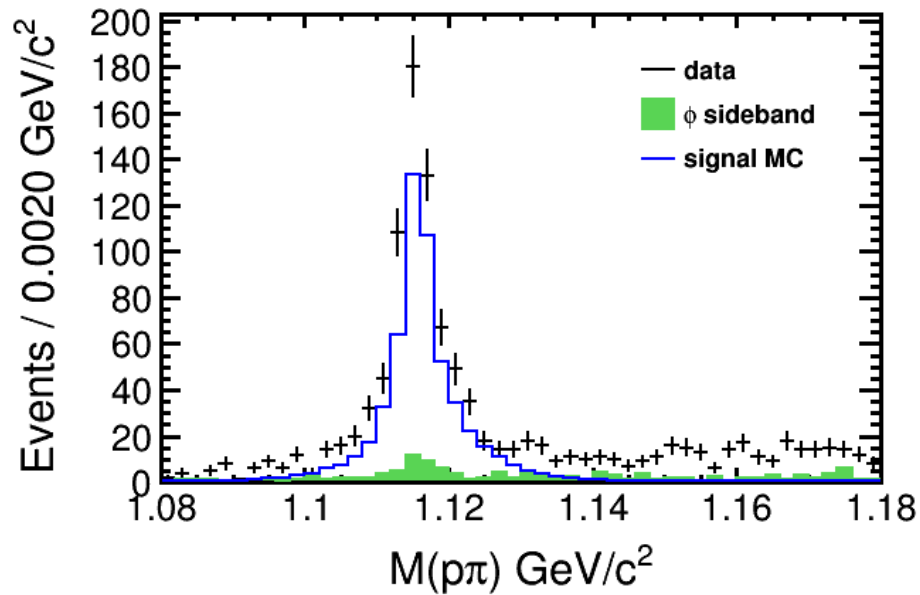
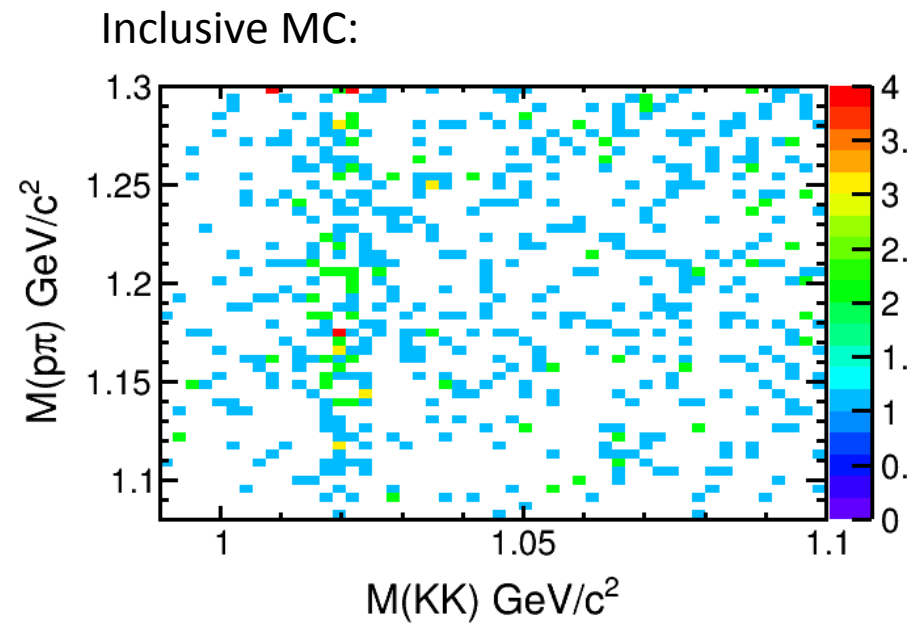
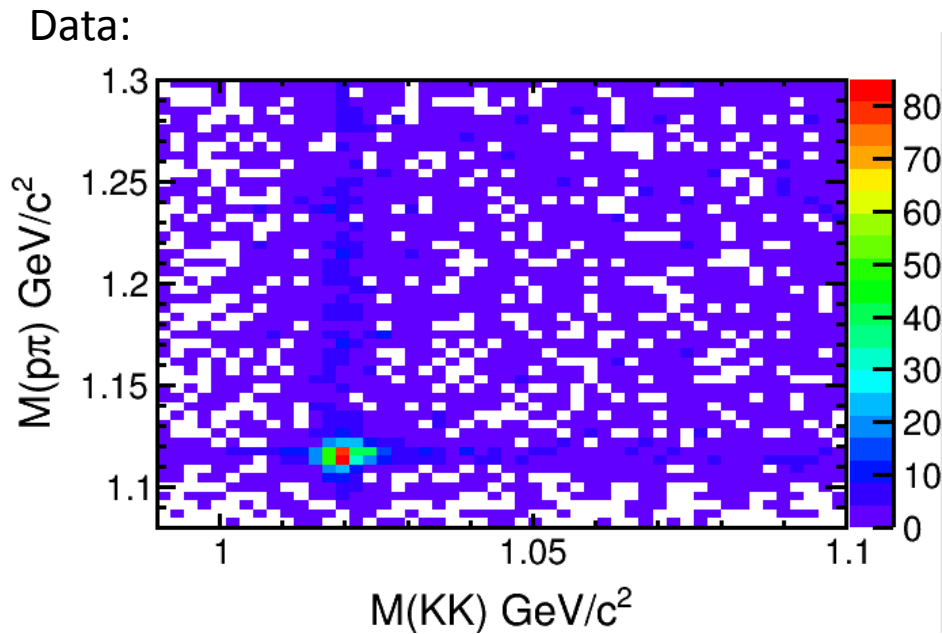
IHEP, Beijing

Event selection

- At least 4 good charged track
 - $V_r < 10$, $V_z < 20$;
 - PID, at least two kaon with opposite charge, one proton and one pion with opposite charge.
- 1C kinematic fit
 - Constraint the missing mass to Lambda's nominal mass
 - Combination with least χ_{1C}^2 is saved.

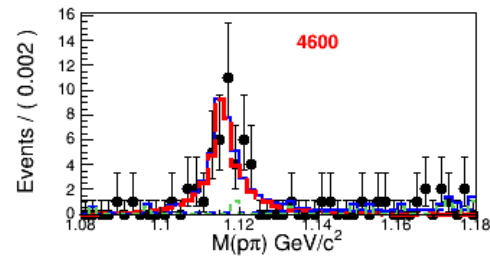
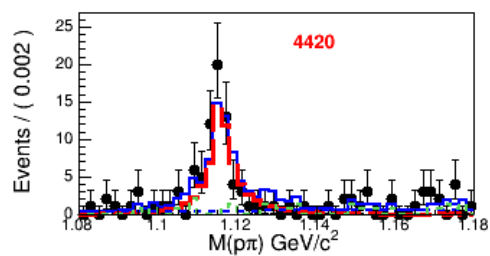
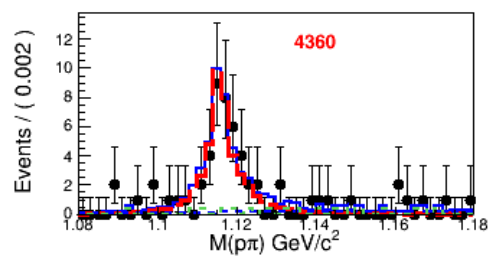
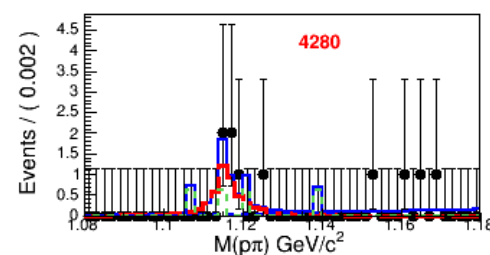
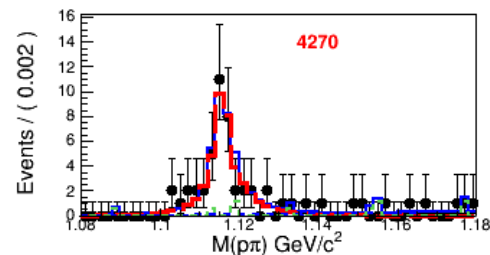
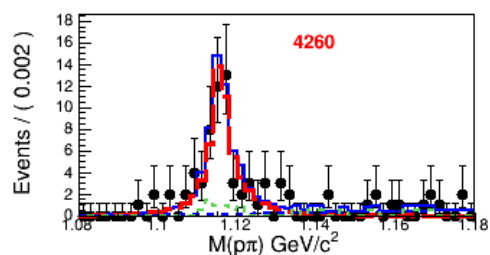
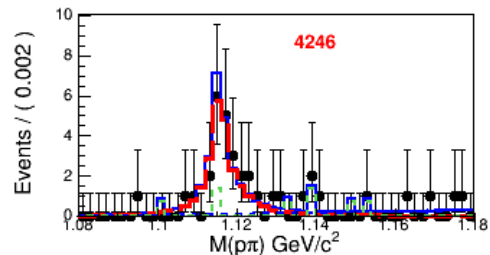
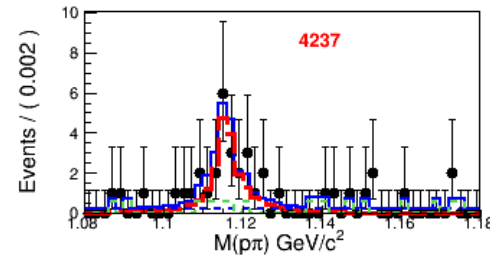
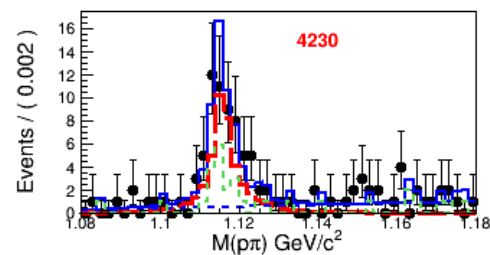
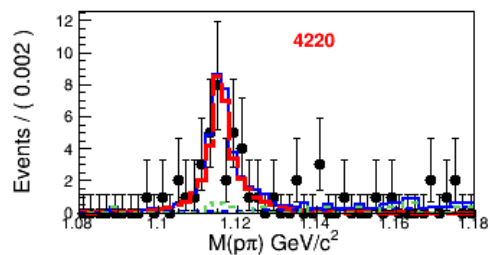
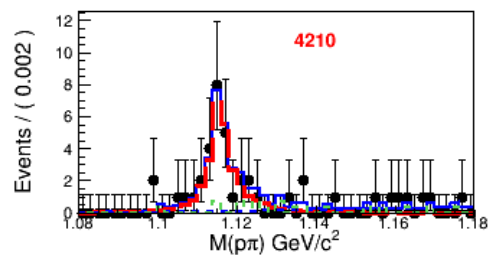
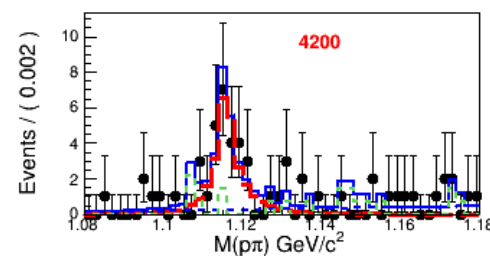
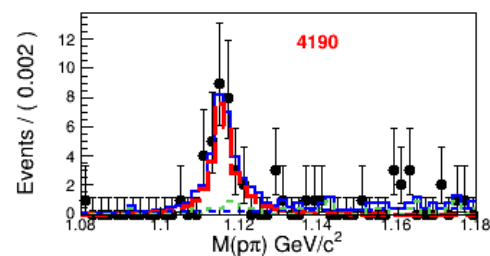
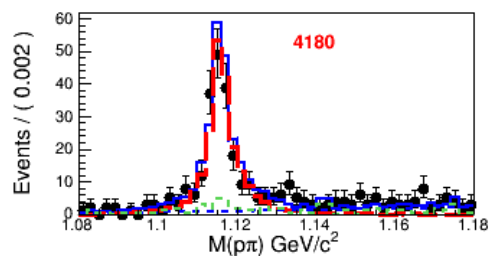
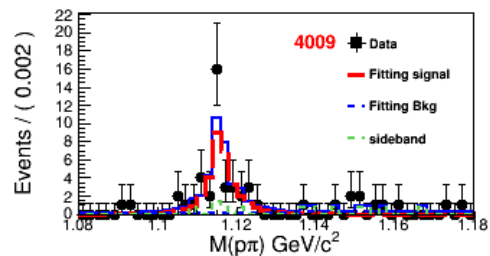


$\chi^2_{1C} < 10$; ϕ signal region: $[1.01, 1.03] \text{ GeV}/c^2$, sideband region: $[0.995, 1.005] \cup [1.035,$



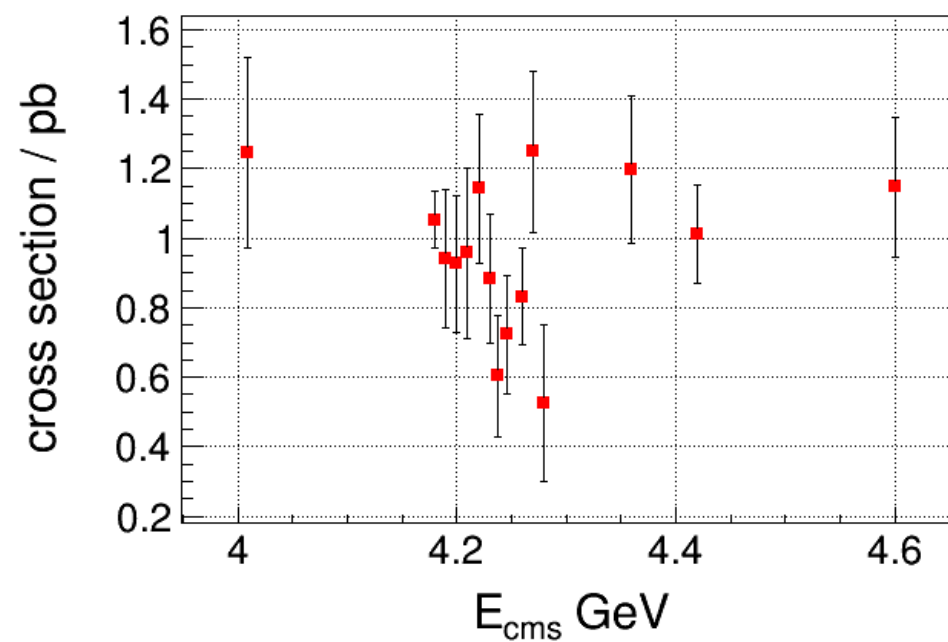
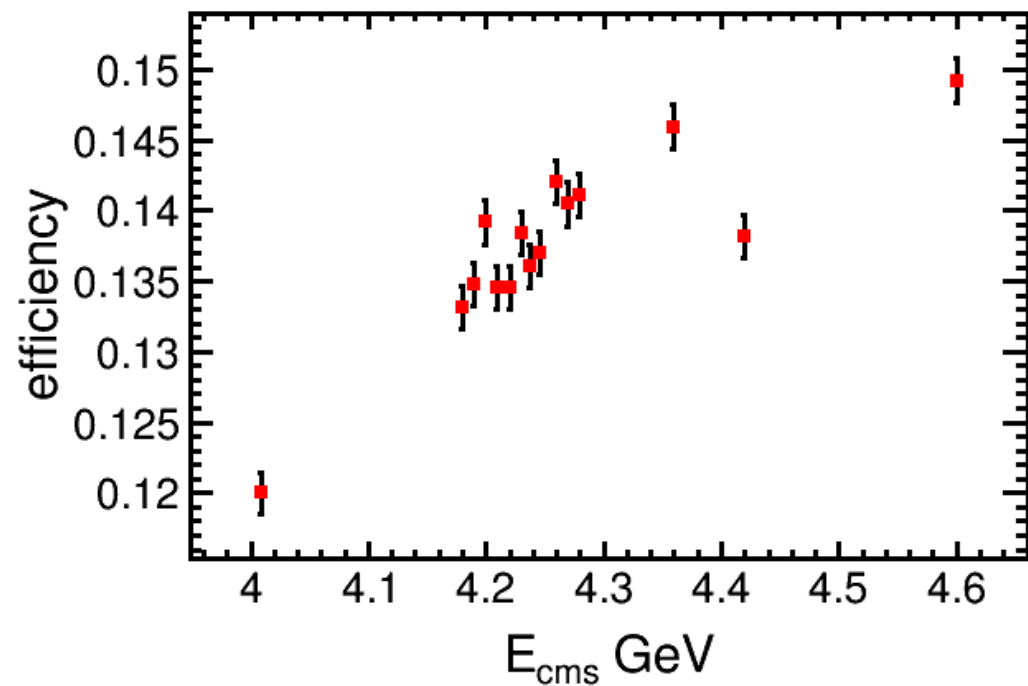
Top left: very clear cluster of $\phi\Lambda(\bar{\Lambda})$ in experimental data
 Top right: can not find $\phi\Lambda(\bar{\Lambda})$ in inclusive MC sample

It seems there are some peaking background according to ϕ sideband.

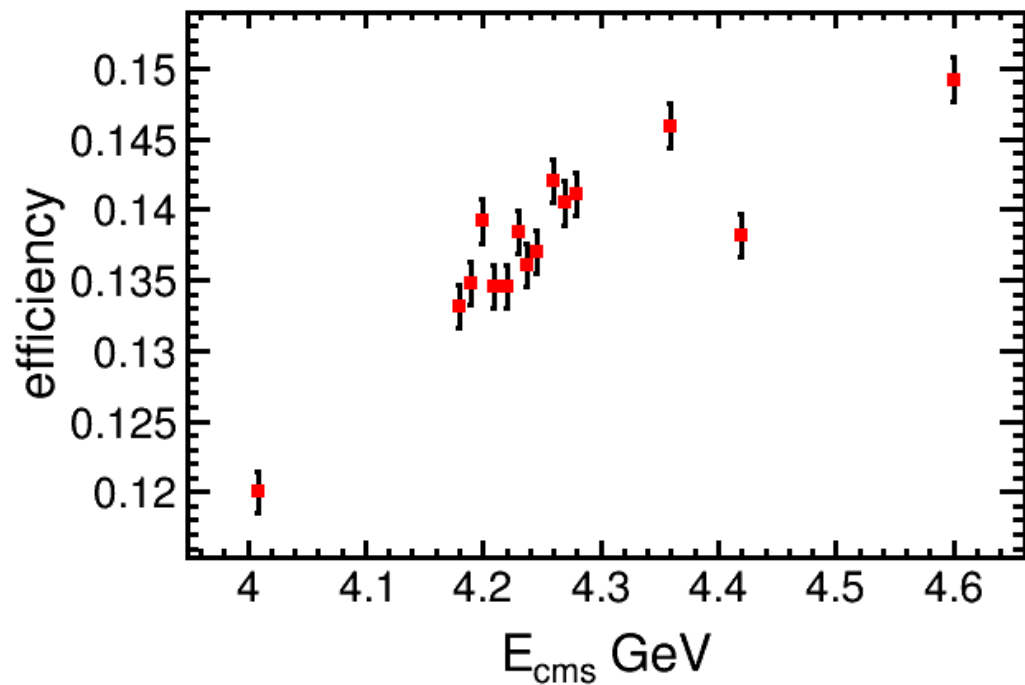


Yield the signal evens based on unbinned maximum likelihood fit. Signal is described with MC shape. Background is described with 1st order polynomial and ϕ 's sideband.

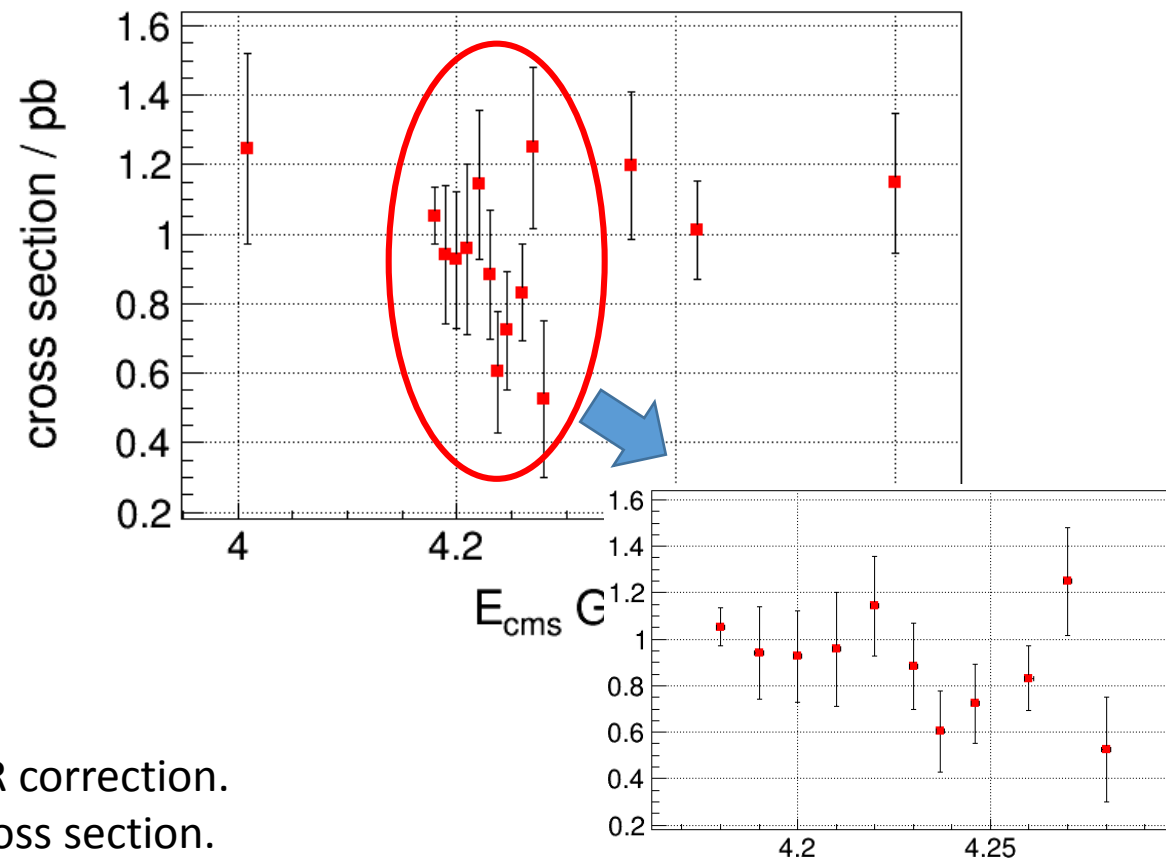
	Efficiency(%)	N_obs	σ_{obs} (pb)	σ_{dress} (pb)
4009	16.03	31.2+-6.9	1.2+-0.3	1.3+-0.3
4180	18.07	196.2+-15.0	1.05+-0.08	0.99+-0.08
4190	19.00	29.9+-6.3	0.9+-0.2	1.0+-0.2
4200	18.77	29.1+-6.2	0.9+-0.2	0.9+-0.2
4210	18.05	28.7+-7.4	1.0+-0.2	1.0+-0.3
4220	18.75	35.4+-6.6	1.1+-0.2	1.2+-0.2
4230	19.39	45.3+-9.5	0.9+-0.2	0.8+-0.2
4237	18.50	19.0+-5.5	0.6+-0.2	0.6+-0.2
4246	19.08	23.8+-5.6	0.7+-0.2	0.7+-0.2
4260	19.90	55.4+-9.3	0.8+-0.1	0.8+-0.1
4270	19.36	41.0+-7.6	1.2+-0.2	1.2+-0.2
4280	19.54	5.8+-2.5	0.5+-0.2	0.5+-0.2
4360	20.54	42.0+-7.5	1.2+-0.2	1.2+-0.2
4420	18.73	65.1+-9.0	1.0+-0.1	0.9+-0.1
4600	21.18	44.0+-7.7	1.1+-0.2	1.2+-0.2



Left plot shows the reconstruction efficiency w/o ISR correction.
Right plot shows the energy dependent observed cross section.



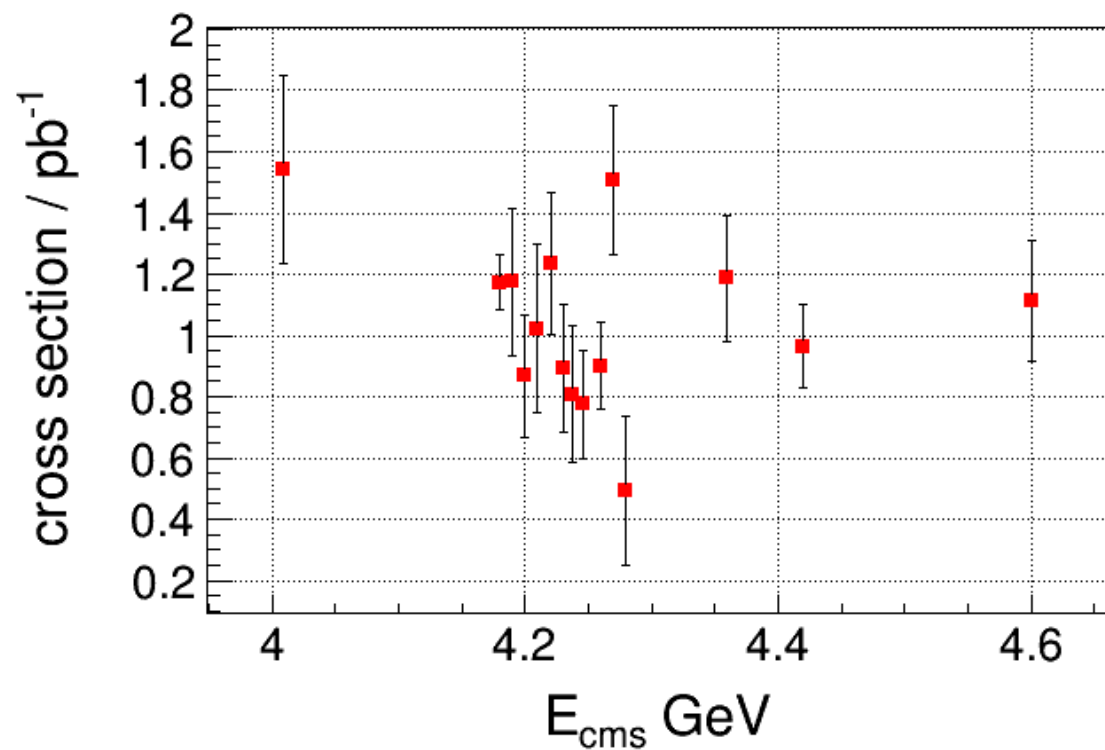
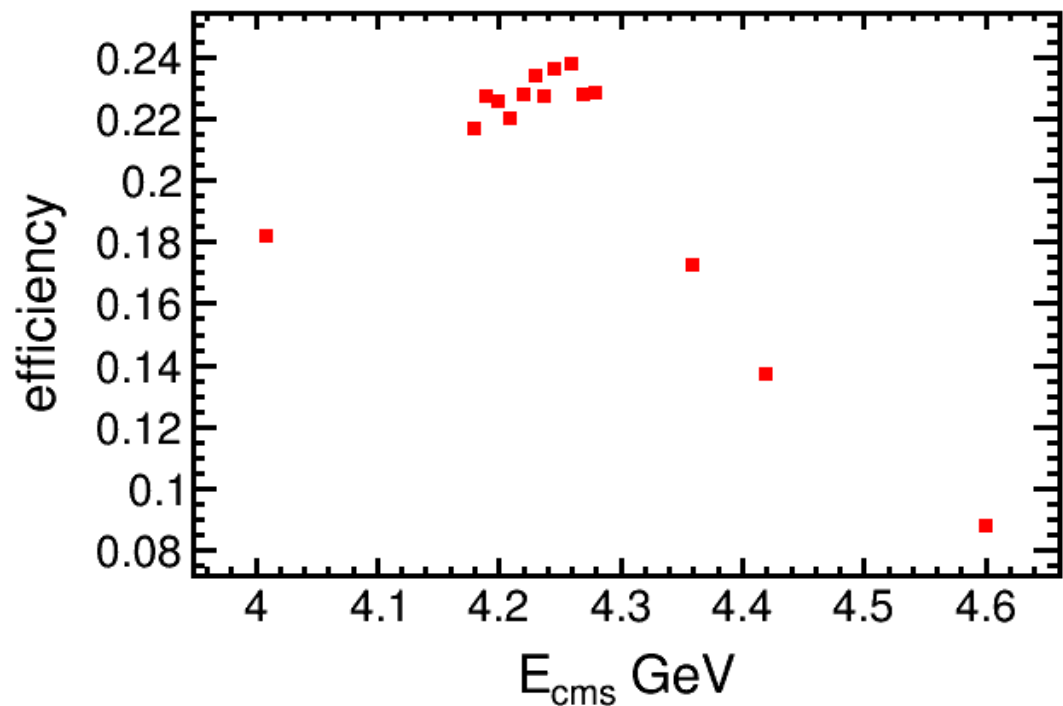
Left plot shows the reconstruction efficiency w/o ISR correction.
Right plot shows the energy dependent observed cross section.



Summary and next to do

- $e^+e^- \rightarrow \phi\Lambda\bar{\Lambda}$ is observed in XYZ data.
- The energy dependent cross sections imply that this decay may not come from continuum process.
- Next
 - Efficiency curve looks strange. We need to understand why.
 - Once we understand the efficiency curve, the iteration to deal with the ISR will be needed.

BACK UP



Left plot shows the reconstruction efficiency assuming the events coming from $Y(4230)$.

Right plot shows the energy dependent dressed cross section.

The ISR correction is obtained by turning the ISR in generator on and off.