

# Group meeting

2025/04/30

# Efficiency difference between Belle and Belle II:

TABLE II: Selection criteria and their efficiencies for  $\gamma\gamma \rightarrow \omega J/\psi$  at Belle

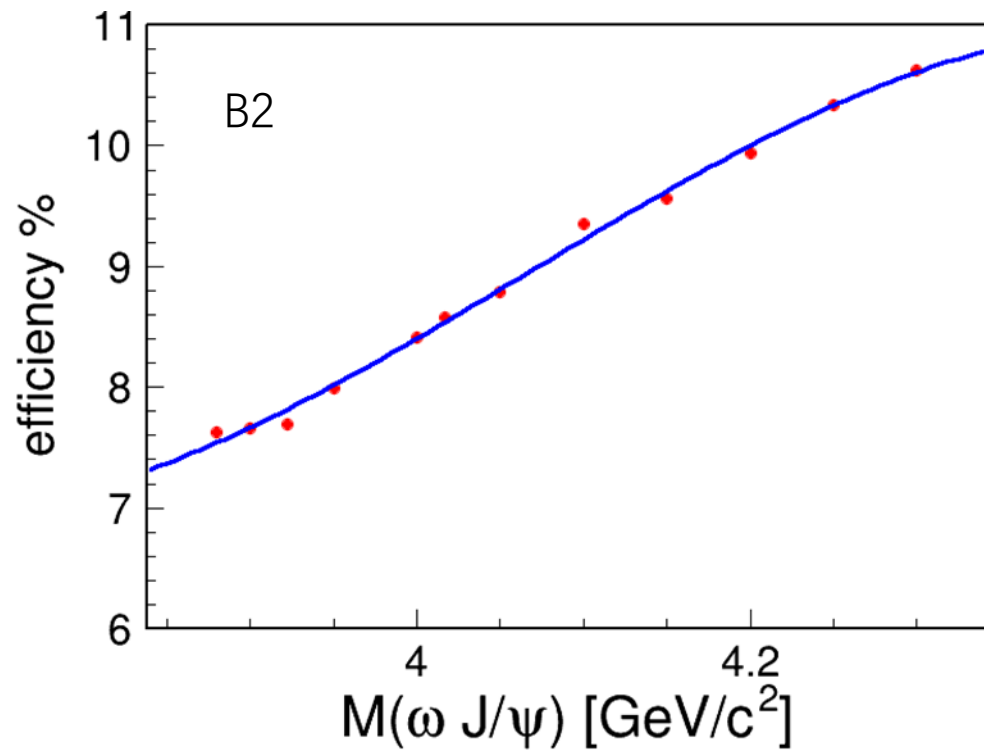
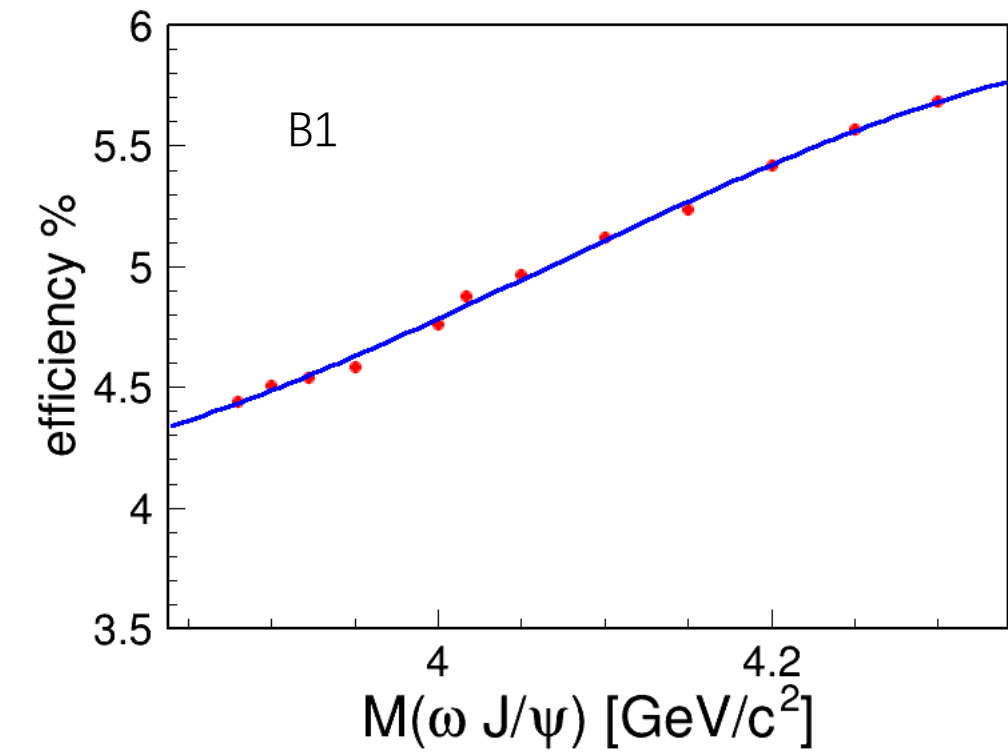
| Selection                                  | Events remained | absolute efficiency (%) | relative efficiency (%) |
|--|-----------------|-------------------------|-------------------------|
| Preselection                               | 28884           | 14.44                   | -                       |
| $\pi$ PID                                  | 28437           | 14.22                   | 98.45                   |
| $\ell$ PID                                 | 27827           | 13.91                   | 97.85                   |
| photon clusterE                            | 22753           | 11.38                   | 81.76                   |
| $\pi^0 \chi^2$                             | 19497           | 9.75                    | 85.69                   |
| $J/\psi$ mass window                       | 17327           | 8.66                    | 88.87                   |
| $\omega$ mass window                       | 16389           | 8.19                    | 94.58                   |
| $P_t^*(\pi^+\pi^-\pi^0\ell^+\ell^-)$       | 11080           | 5.54                    | 67.60                   |
| $M_{\text{rec}}^2(\ell^+\ell^-\pi^+\pi^-)$ | 10922           | 5.46                    | 98.57                   |
| $M_{\ell^+\ell^-\pi^+\pi^-}$               | 10272           | 5.14                    | 94.04                   |

TABLE III: Selection criteria and their efficiencies for  $\gamma\gamma \rightarrow \omega J/\psi$  at Belle II

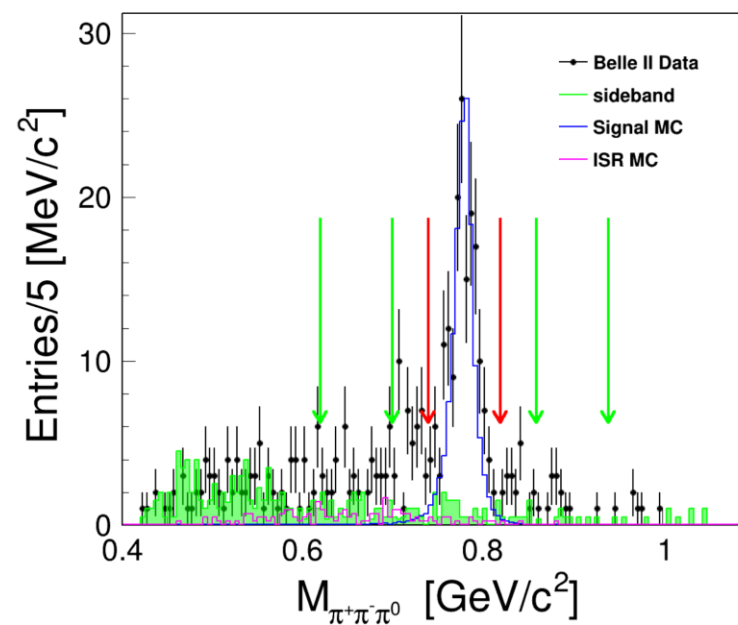
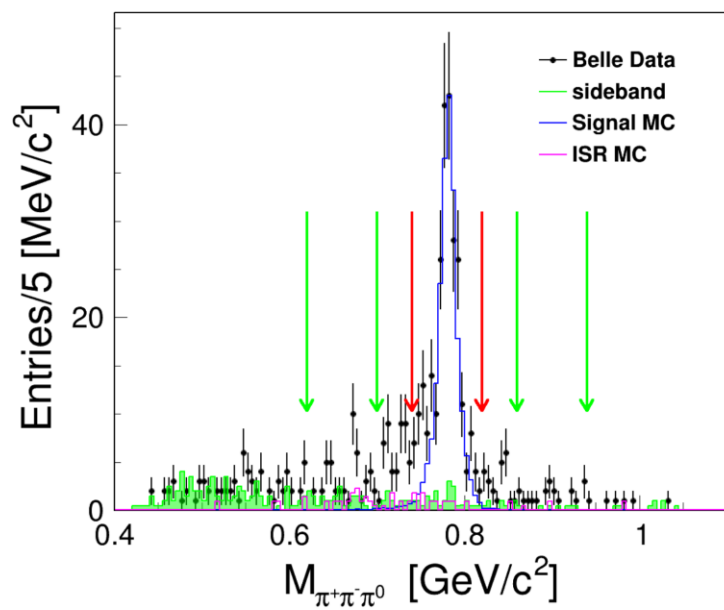
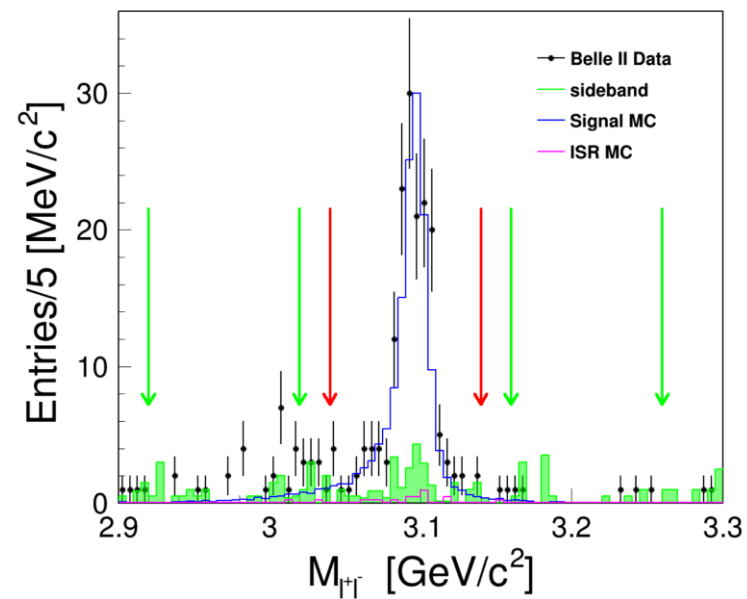
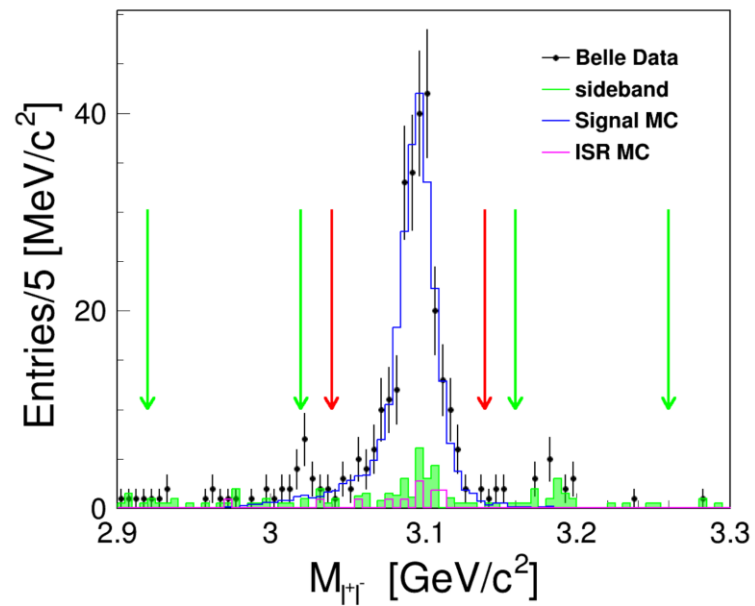
| Selection                                  | Events remained | absolute efficiency (%) | relative efficiency (%) |
|--|-----------------|-------------------------|-------------------------|
| Preselection                               | 34303           | 17.15                   | -                       |
| $\pi$ PID                                  | 33747           | 16.87                   | 98.37                   |
| $\ell$ PID                                 | 32007           | 16.00                   | 94.84                   |
| $J/\psi$ mass window                       | 28776           | 14.39                   | 89.91                   |
| $\omega$ mass window                       | 27670           | 13.84                   | 96.15                   |
| $P_t^*(\pi^+\pi^-\pi^0\ell^+\ell^-)$       | 18905           | 9.45                    | 68.32                   |
| $M_{\text{rec}}^2(\ell^+\ell^-\pi^+\pi^-)$ | 18905           | 9.34                    | 98.77                   |
| $M_{\ell^+\ell^-\pi^+\pi^-}$               | 17614           | 8.81                    | 94.32                   |

Both from MCrd  
B1: 256 events from 980fb  
B2 expected from B1: 164.7 events  
B2 real :165 events consistent with expectation

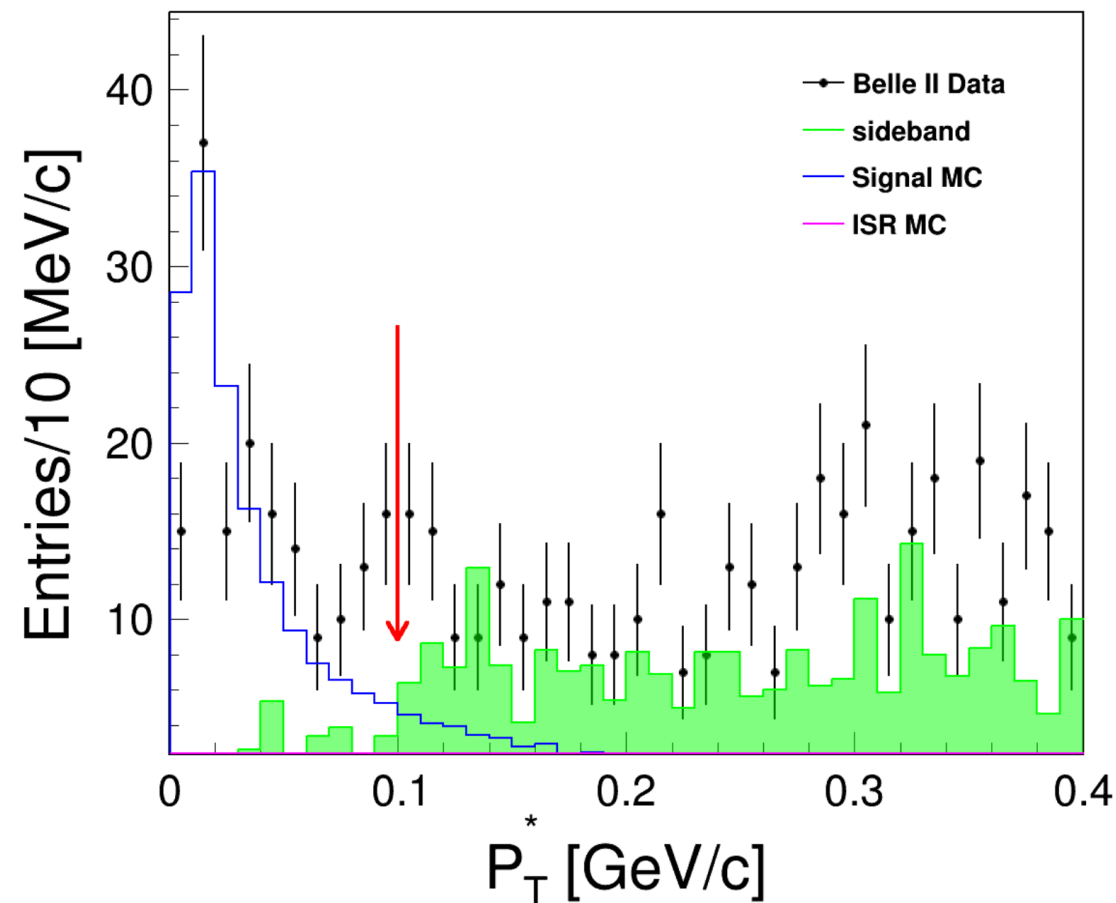
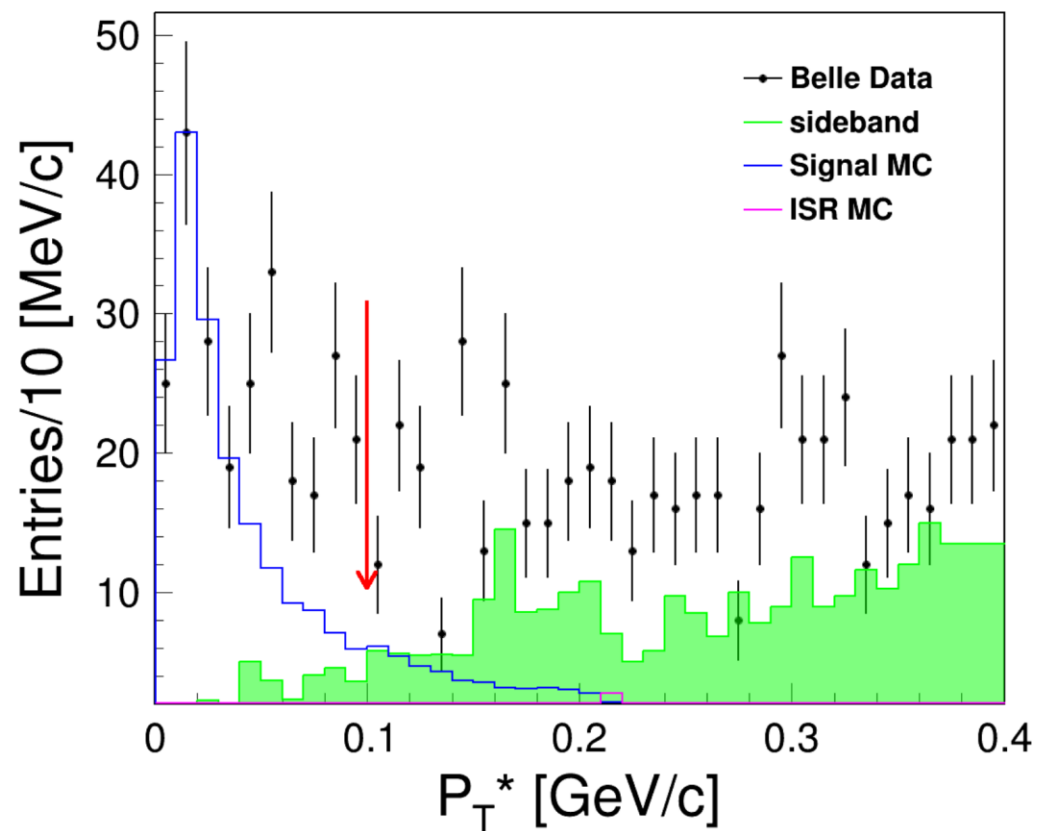
Effcurve:



$J/\psi$  and  $\omega$  signal:



Total pt:



Next to do:

Calculate eff luminosity

Calculate cross section and fitting

Prepare for draft