

JLab E12-17-003 (*nn Λ*)
Analysis Meeting

Graduate School of Science, Kyoto University

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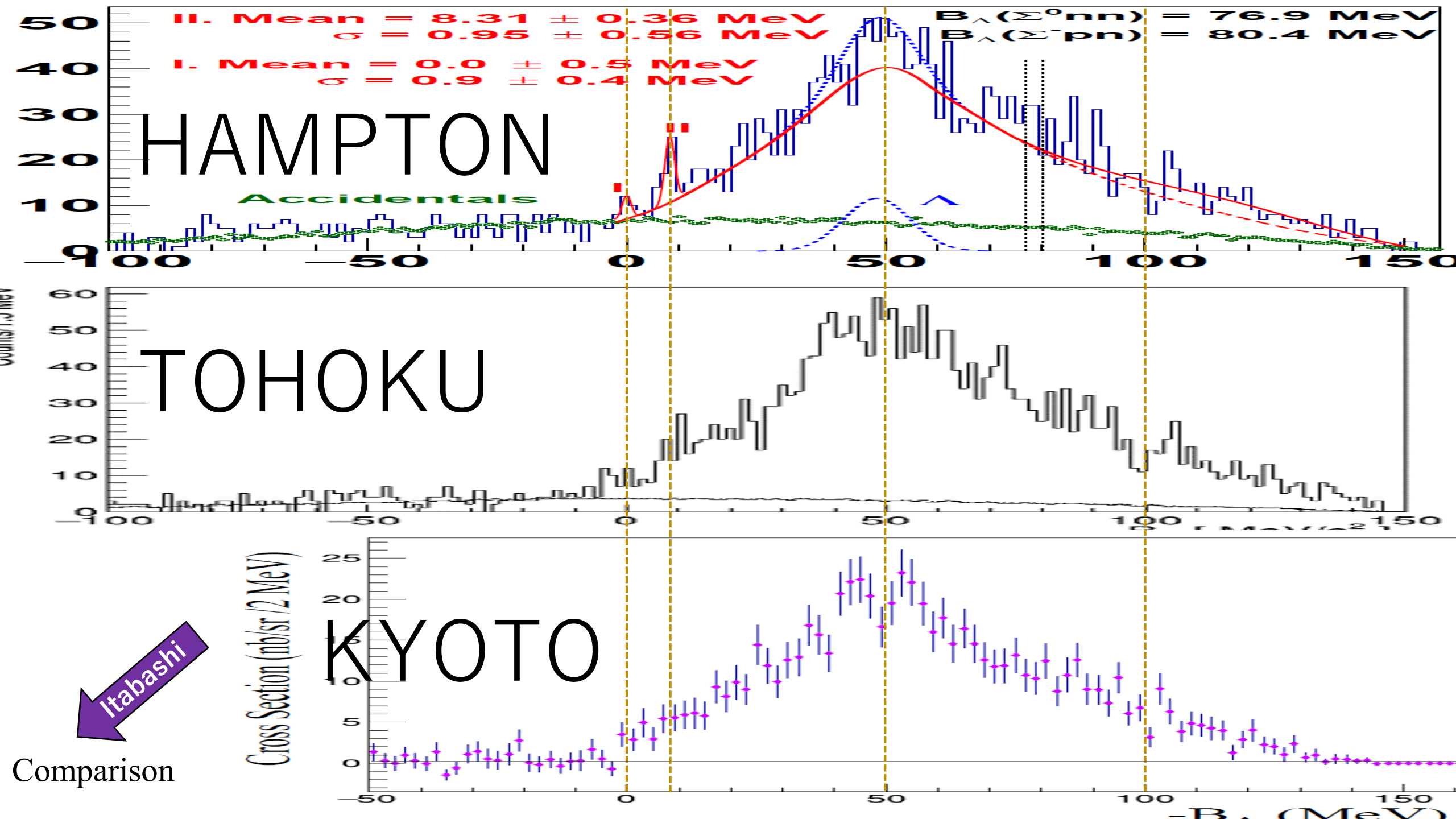
March 31, 2021



京都大学
KYOTO UNIVERSITY



SPIRITS
SUPPORTING PROGRAM FOR INTERACTION-BASED
INITIATIVE TEAM STUDIES



Summary

1. Expected mass resolution

- The intrinsic mass resolution (FWHM):
 - Angle: 8.0×10^{-3} (Hampton) vs. **2.8×10^{-3} (Japan)** ([PDF1](#), [PDF2](#))
 - Momentum: 2.9×10^{-4} (Hampton) vs. **11.2×10^{-4} (Japan)**
 - $\theta_{e'K} \simeq \theta_{e'} + \theta_K$ needs to be taken into account for the $\left(\frac{\partial M}{\partial \theta_{eK}}\right) \Delta\theta_K$ and $\left(\frac{\partial M}{\partial \theta_{ee'}}\right) \Delta\theta_{e'}$ ([PDF3](#))
- Total resolution \leftarrow GENAT4 (INPUT = FP resolutions)

2. Momentum tuning with $\Lambda(H)$, $\Sigma(H)$, $\Lambda(T)$

- (The angles \leftarrow calibrated by the only SS data)
- Not the best, but **should be compromised** ([PDF2](#))
- Better to avoid the risk from the tuning with unknown states (A1) ([PDF4](#))
 - We agree that heavier mass calibration data help a lot

3. Cross section

- Detailed analysis

Talk by Nagao

Suzuki

Suzuki

Suzuki

Suzuki

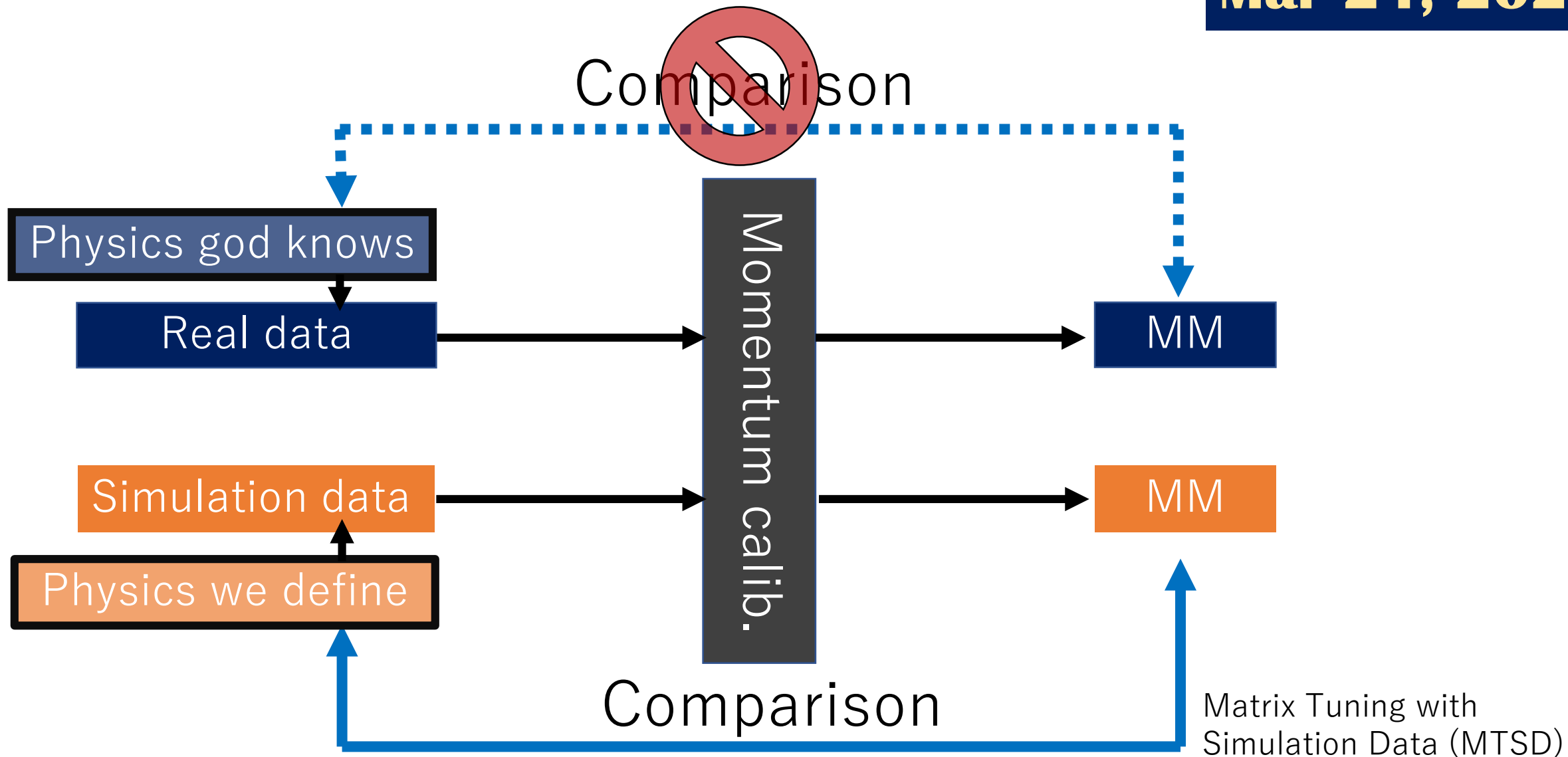
TG

Nagao

Suzuki

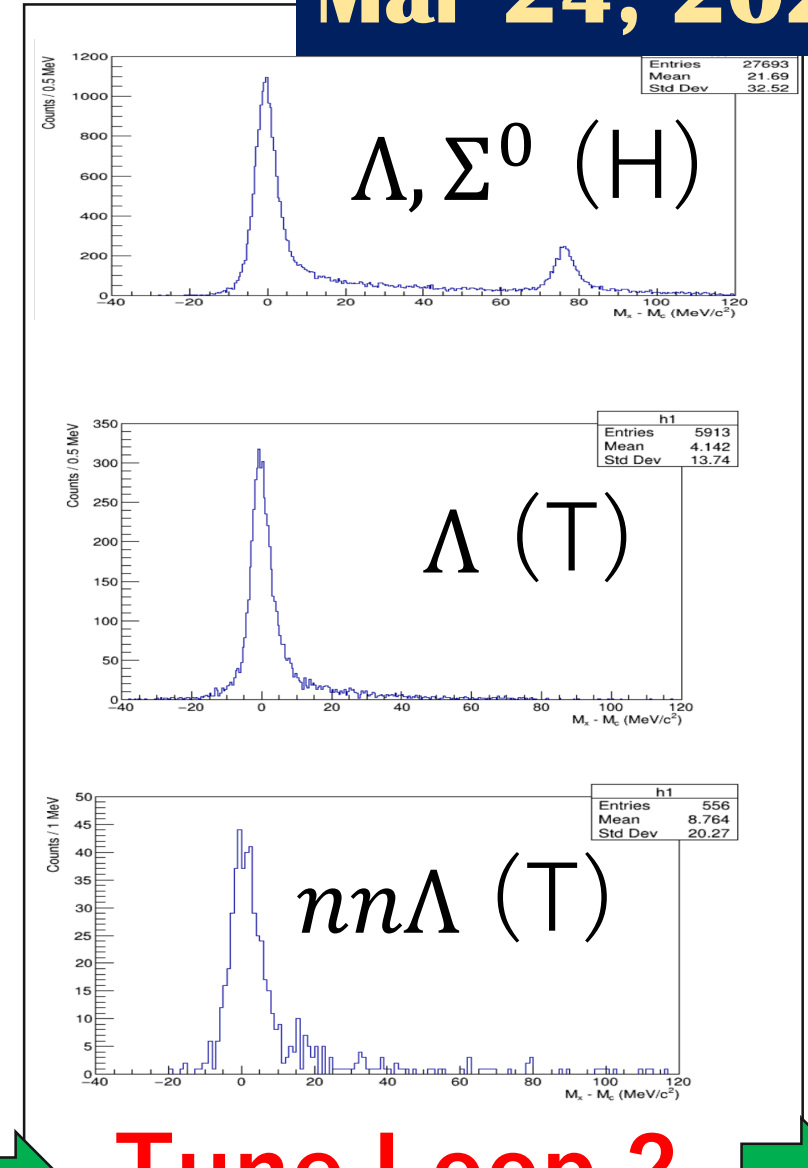
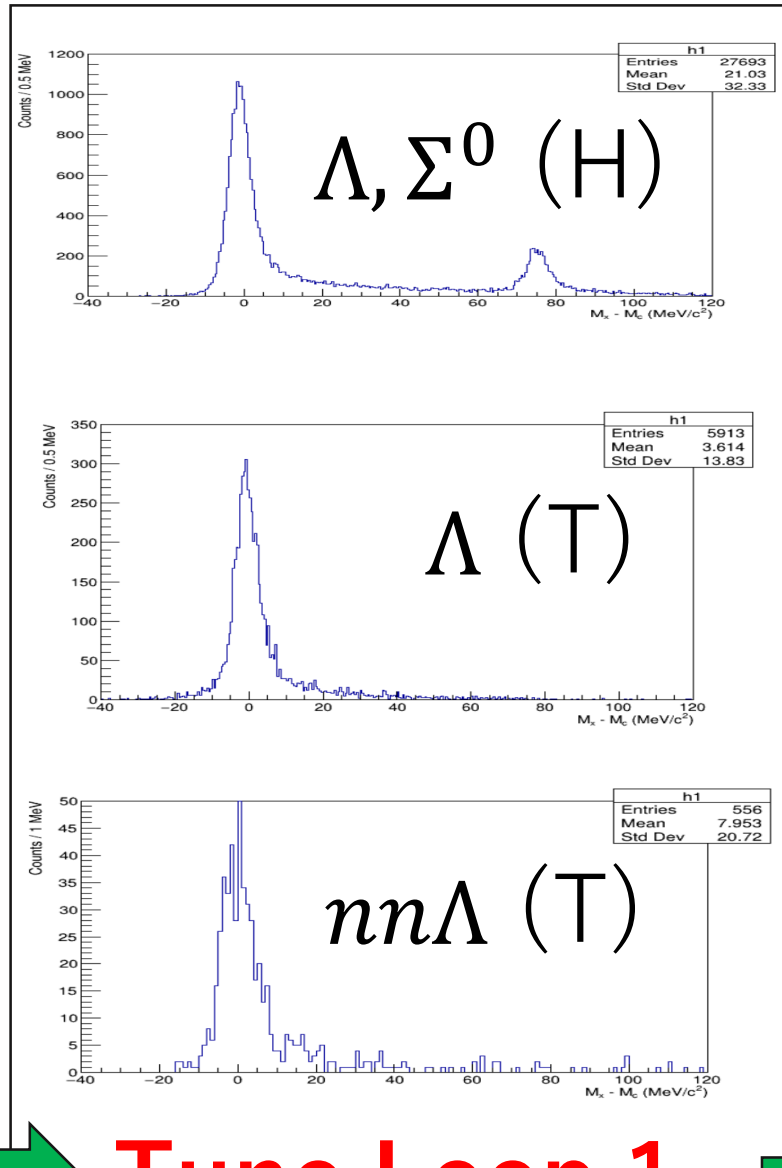
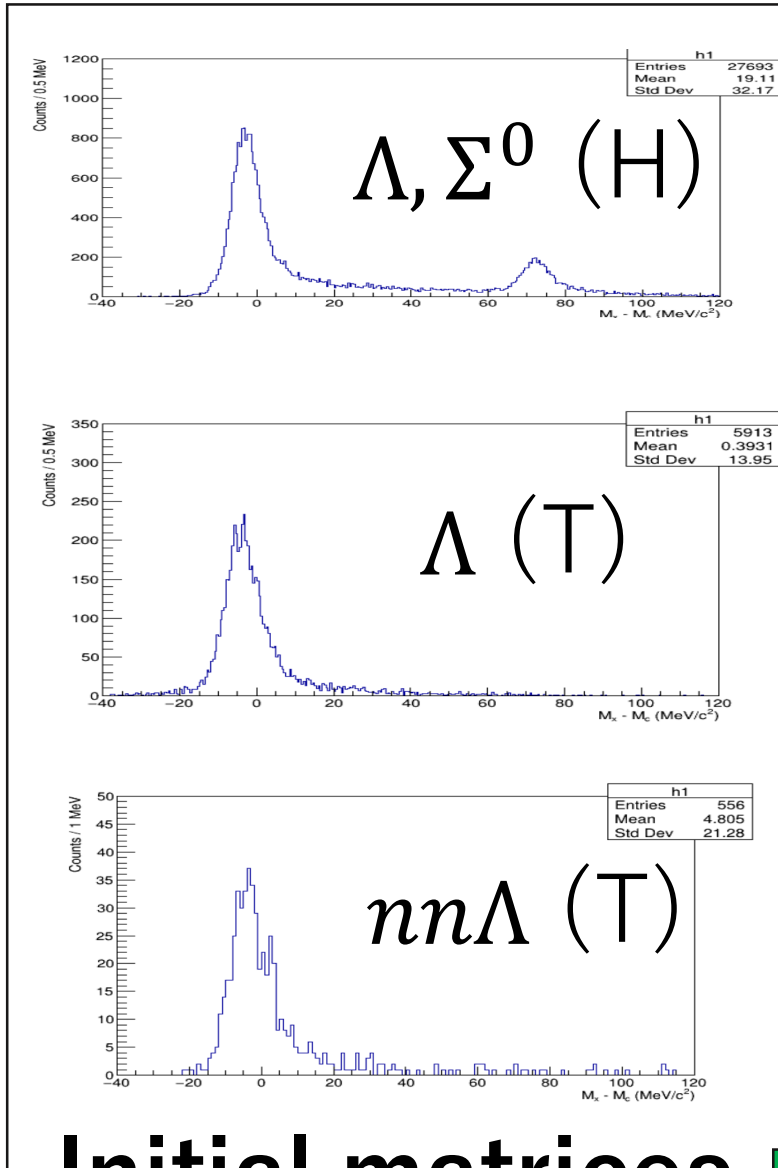
Validity check of our Momentum calibration

**Slide from
Mar 24, 2021**

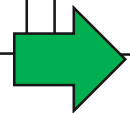


Momentum calibration by using only Λ (H), Σ^0 (H), and Λ (T)

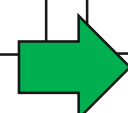
**Slide from
Mar 24, 2021**



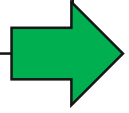
Initial matrices



Tune Loop 1



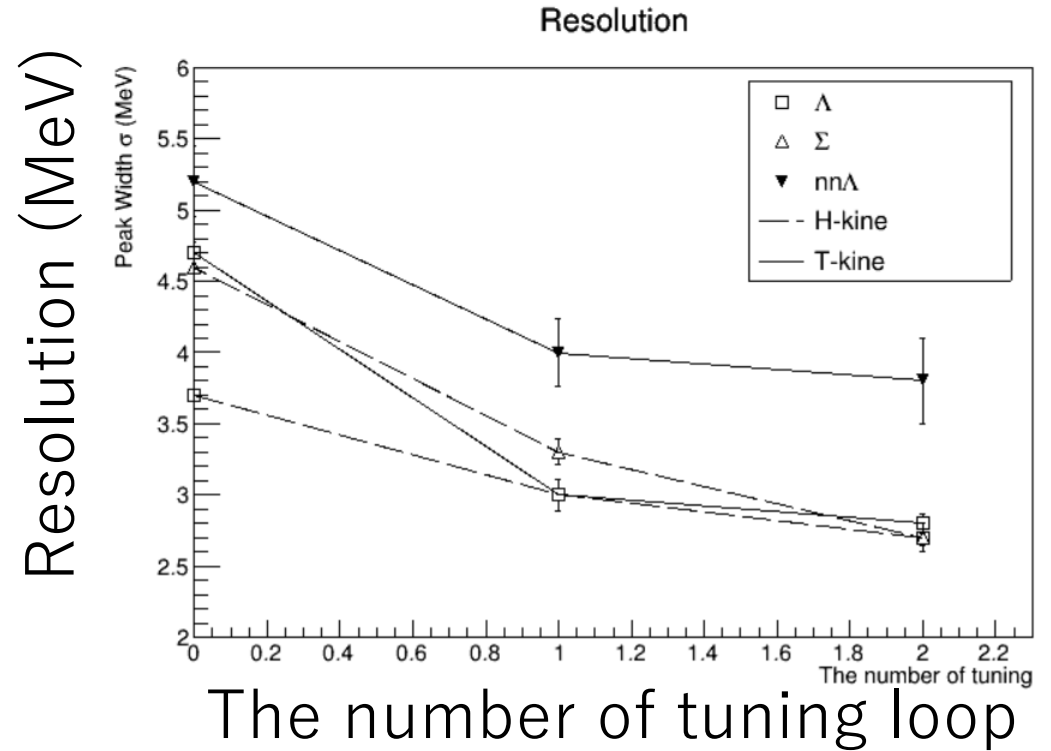
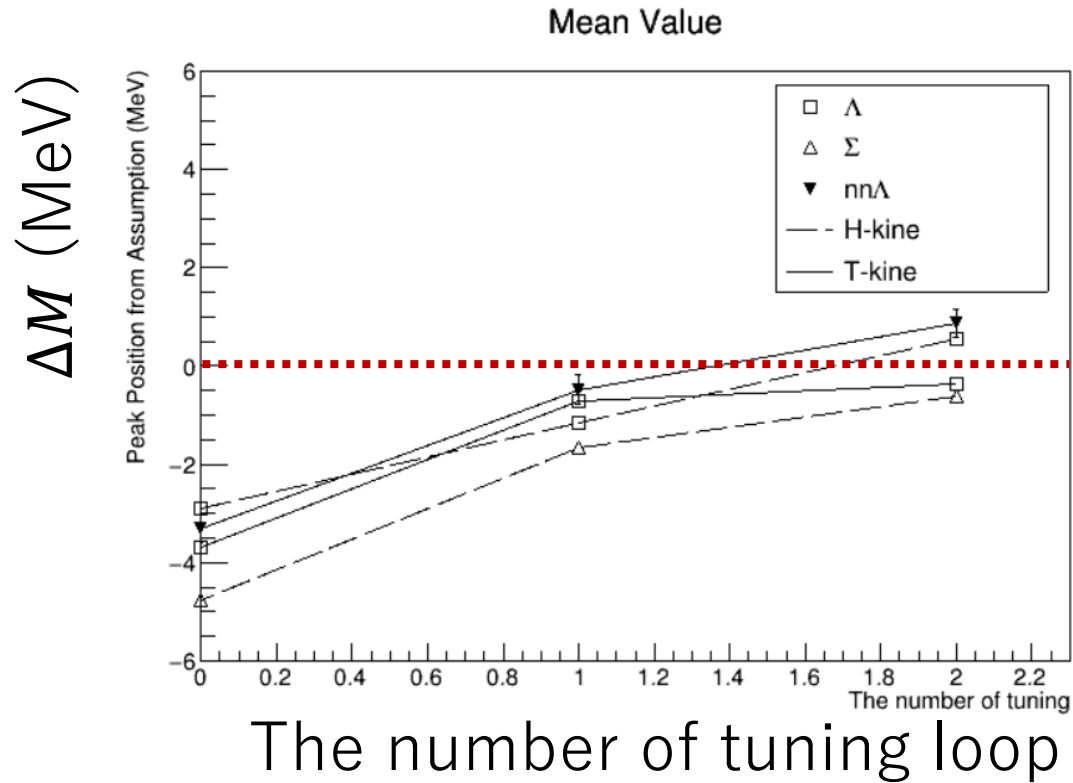
Tune Loop 2



Result of the trial (MTSD)

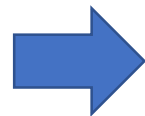
Momentum calibration by using only Λ (H), Σ^0 (H), and Λ (T)

Slide from
Mar 24, 2021



Tuning with Λ (H-kine), Σ (H-kine), Λ (T-kine)

$nn\Lambda$ follows the Λ and Σ^0



No issues for $A = 3$ were found so far
(not high precision yet though)