ReneSANCe Generator Update

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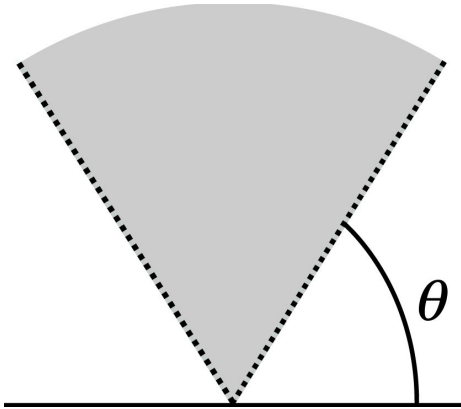
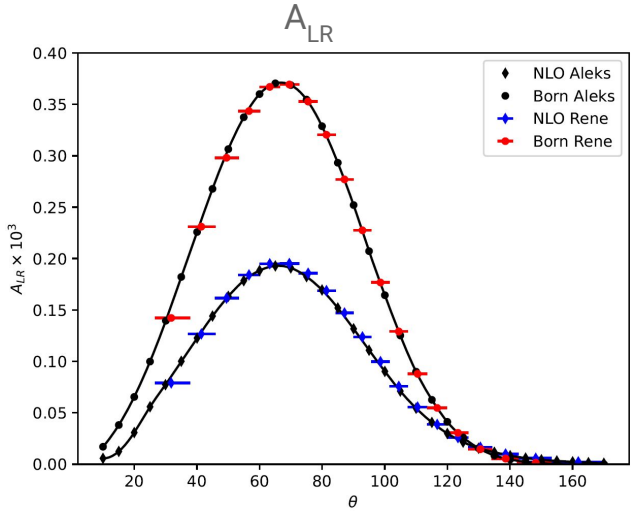
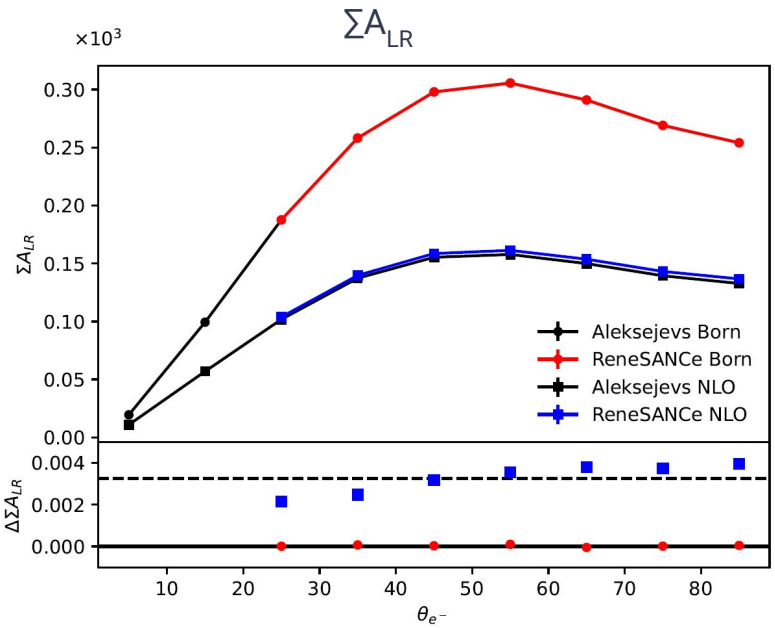
Comparisons to Aleksevejs et al.

- Theory paper presents two observables to compare to: A_{LR} and $\sum A_{LR}$
- A_{LR}
  - The asymmetry at a specific e- angle
  - In ReneSANCe, integrate in angular bins of 0.05 in cosθ
- $\sum A_{LR}$
  - The asymmetry integrated over an acceptance *a*, $|\cos\theta| < \cos a$



Comparisons to Aleksevejs et al.

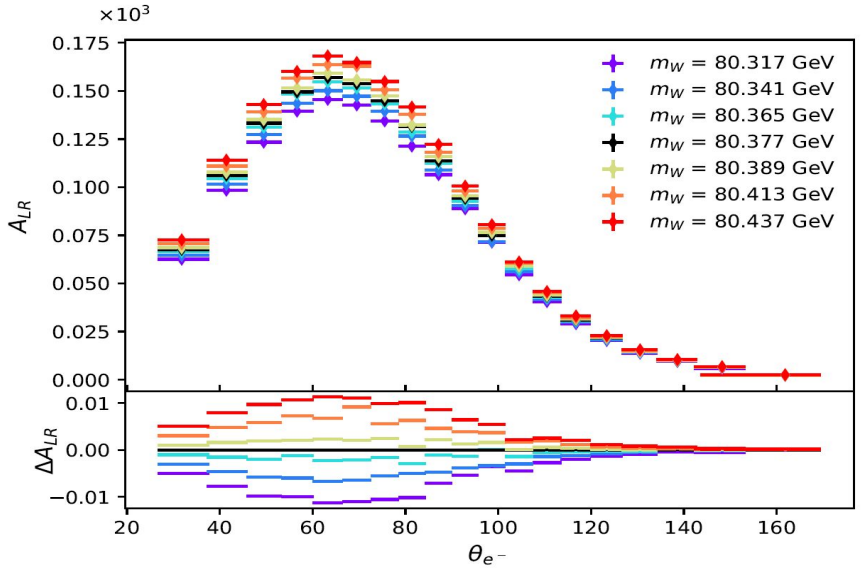


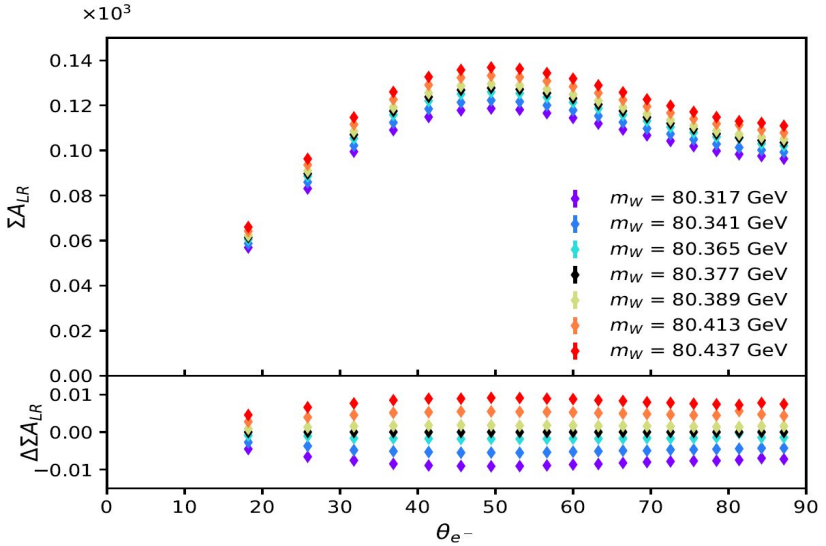


- Disagreement in $\sum A_{LR}$ at an average 3.3×10^{-6} (2.3%)
- Understood to arise from NNLO effects
- Chiral Belle should achieve a statistical uncertainty of 2.0% with 40 ab^{-1}

$\sin^2\theta_W$ sensitivity

- In order to determine the expected sensitivity of a $\sin^2\theta_W$ calculation from an A_{LR} measurement, the value of m_W is varied in steps of 12 MeV
- $\sin^2\theta_W = 1 - m^2_W/m^2_Z$





$\sin^2\theta_W$ sensitivity

- The deviations correspond to ~1.5% deviation in A_{LR} value per 12 MeV shift in M_W
- Using an expected 2% statistical uncertainty in the A_{LR} measurement, gives a $\sin^2\theta_W$ uncertainty of 0.00033
- The world average is ~0.0001, a factor of 3 better, notable contributions come from:
  - LEP + SLD ($A^{0,b}_{FB}$): ±0.00029
  - SLD (A_l) : ±0.00026
  - CMS ($137 fb^{-1}$): ±0.00031

Next Steps

- Some editing to do on the paper
  - need to check comparison to other measurements (MSbar, etc..)
- Will send to theorists and generator authors for comment and authorship offer