Addendum STAR Beam Use Proposal - Section 3.4.1 'Longitudinal spin program'

Significant progress has been made very recently on the determination of full NLO di-jet predictions[1,2] for the longitudinal double-spin asymmetry A_{LL} including an evaluation of scale uncertainties. Furthermore, an inconsistency in the usage of CTEQ5M in the determination of the unpolarized distribution functions has been found and has been corrected for the determination of A_{LL} based on a LO MC approach. These changes are now reflected in an updated Figure 3.14 shown below. This Figure is meant to replace Figure 3.14 in the current BUR document on page 29. Figure 3.14 shows the longitudinal double-spin asymmetry A_{LL} for di-jet production as a function of the invariant mass M for different topological combinations of the STAR BEMC and STAR EEMC region. The projected uncertainties are shown for a luminosity of $50pb^{-1}$ and a beam polarization of 60%. Those projected uncertainties are compared to a LO evaluation of A_{LL} and a full NLO A_{LL} calculation. Scale uncertainties are shown as a shaded band for DSSV and GRSV-STD reflecting a variation of the invariant mass M as the underlying hard scale of 2M and 0.5M. Asymmetric cuts are imposed for both the LO MC and the NLO determination of $p_{T3}>7$GeV and $p_{T4}>10$GeV. A cone radius of R=0.7 has been used. Good agreement is found between a LO MC evaluation of A_{LL} and a full NLO calculation with small scale uncertainties.

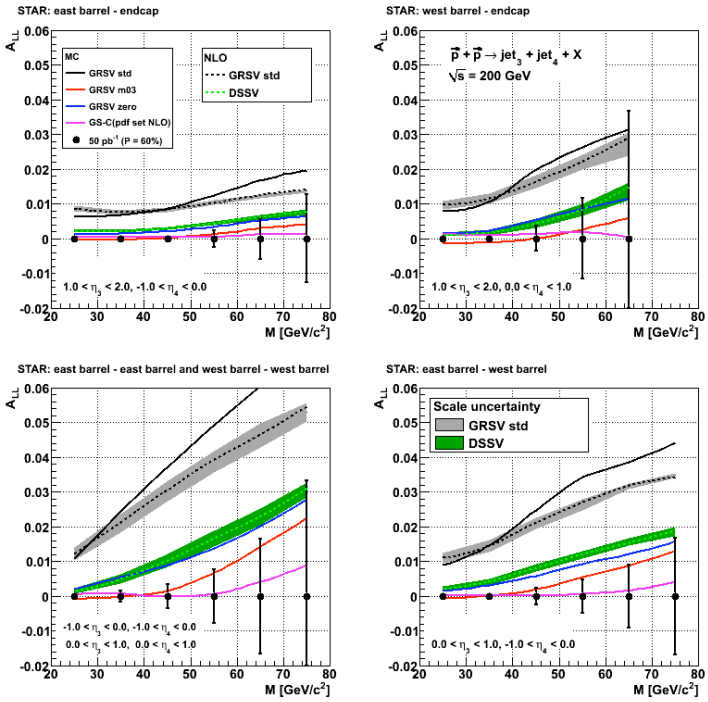

Figure 3-14: Longitudinal double-spin asymmetry A_{LL} for di-jet production as a function of the invariant mass M for different topological combinations of the STAR BEMC and STAR EEMC region.

[1] D. de Florian and W. Vogelsang, private communications.
[2] D. de Florian et al., NPB **539**, 455 (1999).