

Questions for the round table participants:

Status, challenges and prospects of SDC calculations for quarkonium production

- Aim and applicability of the codes (processes, observables, kinematic conditions) and their deliverables
- Theoretical uncertainties
- New applications (PDF fits, TMDs, ...)
- Main challenges behind numerical computations
- Expected improvements in perturbative calculations

Physical objectives, uncertainties and validity domain

- What quantities does your code calculate (unpolarized SDCs, polarized SDCs, ...) and for what particles, collisions systems and processes?
- In what way the theoretical uncertainties due to renormalization/factorization scale dependence, PDFs, heavy quark mass, α_s , etc. are or can be implemented in the codes?
- Is it possible to provide, with each calculation, the indication of a kinematic region of validity where the calculation is reasonably more stable and reliable?
For example, is the "user" expected to safely use a given SDC calculation at both high and low p_T in a LHC experiment or as a function of x_F in a fixed-target experiment?
- What additional features should be included in the code for its use in new applications, such as in fits for the (nuclear) PDFs and in TMD studies?
- What are your prospects for improved perturbative calculations (higher α_s and ν orders) ?

Computational challenges

A user's perspective

A code should ultimately provide the SDCs for the desired experimental conditions in a reasonable time and with the available computing resources.

However, there seem to be time/resource challenges at the computational level, denoted by the following facts:

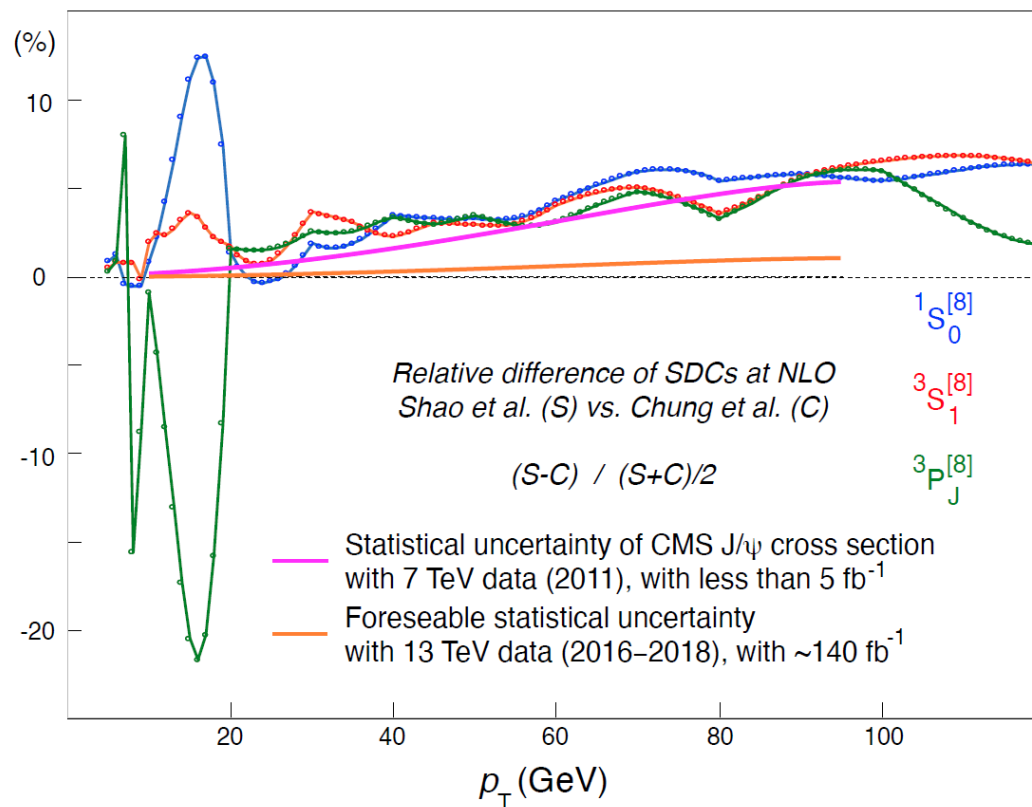
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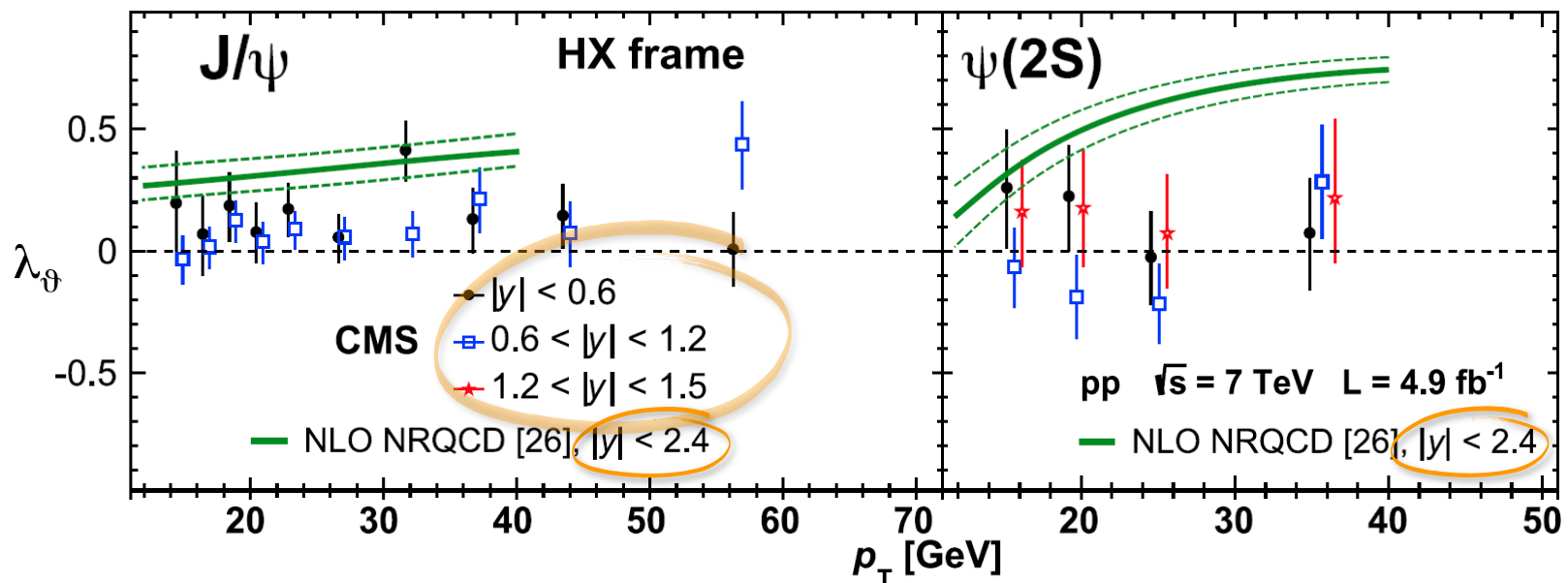
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- What are the main difficulties in the numerical calculation of the SDCs?
 - What improvements in resources or algorithms are needed to increase speed and numerical precision (or stability) of the calculations?
 - What part of the calculation is most resource-intensive and/or prone to instabilities? Is it the calculation of the (experiment-independent) partonic process? Or the convolution with the PDFs yielding the (experiment- and) \sqrt{s} - p_T - y -dependent results?