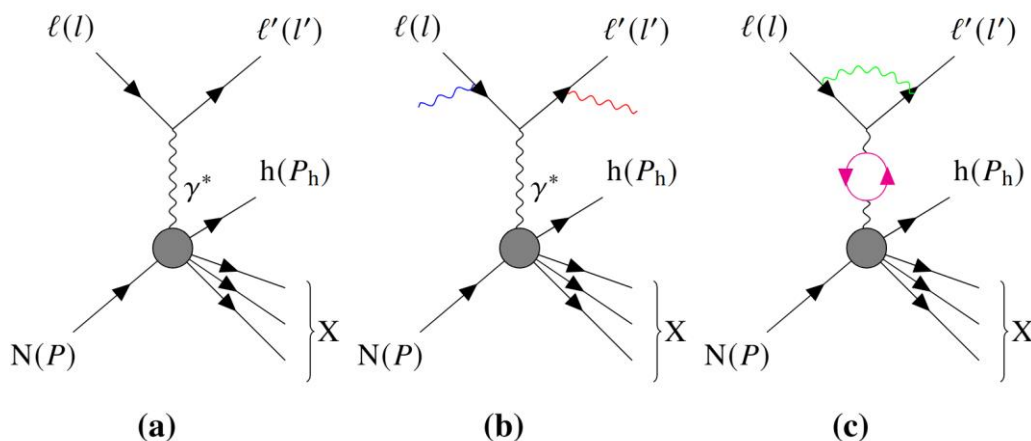


Radiative Corrections for SIDIS off isoscalar target at COMPASS

Project type	SFG/student project
Language	English (possibly Czech)
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Keywords	SIDIS; COMPASS; nucleon structure; radiative correction
Workload	1 semester

During its data-taking period from 2002 to 2022, the COMPASS experiment collected a large dataset of SIDIS events using both proton and deuteron targets. These measurements provide important input for extracting transverse-momentum-dependent parton distribution and fragmentation functions (TMDs), which describe the transverse structure of the nucleon and the hadronisation process. The observables are typically analysed using the leading-order (tree-level) SIDIS cross section, as in (a). However, radiative effects and higher-order contributions can bias such leading-order analyses (figures (b), (c)). While radiative corrections are well understood for inclusive measurements, they do not fully account for dependencies on hadronic variables. Recently, a new method has been developed within the COMPASS collaboration to include these effects consistently. This approach is now being applied to proton data, whereas earlier results for deuteron targets did not include such corrections.



• Project Aim

A new simulation-based approach has been applied for the correction of the radiative effect. Results off proton target with this correction will be published soon. This project aims at correcting the 2004 data on the isoscalar target, which have already been published by the COMPASS collaboration.

• What you will learn

- * Data analysis in high-energy physics.
- * **Coding:** C++, ROOT.

• Key milestones

- * Introduction, Literature review
- * Write a root script, which will access the necessary information for the analysis from a root TTree provided by the supervisor.
- * Study simulated SIDIS events with and without radiative effects included in the simulation.
- * Compare your results with the work on the proton target.