

JAM3D: Overview

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Project Scope

■ TMD fits

- + single fits → Maximum Likelihood (ML)
- + MC fits → Nested Sampling (NS)

■ Impact studies for future measurements

- + Reweighting MC samples with new pseudo data sets

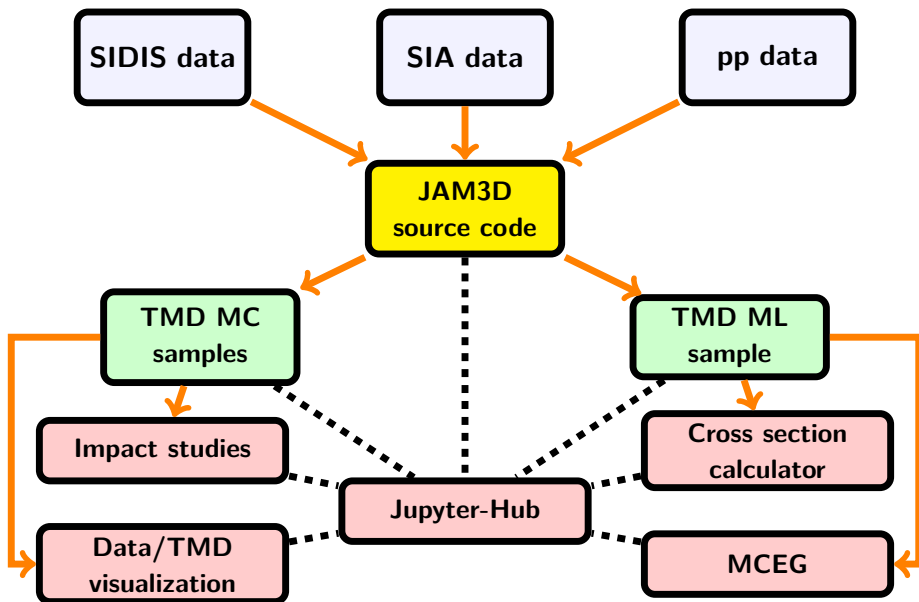
■ Data visualization

- + Dedicated data vs theory visualization
- + TMD plotter

■ Cross section simulation

- + Evaluation of cross sections
- + Single particle MCEG

Road Map



TMD fitter

■ Features

- + Fast evaluation of residuals → powered by dedicated parallelization scripts (based on ZMQ)
- + Parallelization can take advantage of cluster environments:
 - JLab HPCs
 - Amazon web services (AWS): EC2, ECS via docker images
- + Modularized framework. Easy to incorporate new observables

■ Methodologies

- + Maximum likelihood analysis (ML)
 - Terminal based ("input.py") + jupyter-notebooks
 - Also via jupyter-notebook (useful for jupyterhub environments)
- + MC analysis based on Nested Sampling (NS)
 - Terminal based ("input.py")
 - Ideal to run on a cluster environment

Impact studies for future measurements

■ Methodology

- + Simulation of new observables based on existing MC samples
- + Bayesian reweighting → fastest implementation

■ MC samples repository

- + Dedicated TMD MC parameter samples generated from existing data
- + Access to the input files for the MC samples in case new samples are need within a different setup (change in parametrization, TMD theory, etc.)
- + Dedicated jupyter-notebooks templates for simulation and impact studies

■ Jupyter-hub frontend

- + No local software installation
- + Dedicated jupyter-hub server packed with JAM3D + MC samples repositories
- + Users needs to upload jupyter-notebooks from from repository

Data visualization

■ Gallery of TMD studies

- + Dedicated repo for jupyter-notebooks to display:
 - o data vs theory
 - o 2D, 3D TMDs plots (nucleon imaging)

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Cross section simulation

■ Features

- + Dedicated jupyter-notebooks for cross section evaluation
- + Dedicated jupyter-notebooks for single particle event generator

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