

Exercise: Maximum Likelihood Fitting

Wednesday 26 March 2025 16:30 (1 hour)

Maximum likelihood fitting is central to many high-energy physics analyses, yet modern software makes it easy to use as a black box without understanding the underlying statistics.

The statistics lectures in the main CSC and the tCSC on ML introduce the topic of likelihood, exploring the concept and showing its importance in data analysis. However these lectures do not have the time to dive into the more practical aspects of working with likelihoods, including performing maximum likelihood fits. Therefore I believe, a lecture on this topic, picking up where the CSC lectures left off and going more in depth on the fitting procedure makes for a natural continuation of the school.

I propose a lecture, starting with a brief refresher on the topic of likelihoods, followed by an introduction to the concept of likelihood fitting and the underlying mathematics. Lastly I will get more specific on the topics of binned and profile likelihood fits. After the lecture the school participants are given a hands on exercise where they can perform a simple example of a maximum likelihood fit themselves. Through all of this I want to focus more on the underlying statistics and calculations, instead of relying on “out of the box” “plug and play” algorithms.

This session will help participants build both conceptual and practical skills in maximum likelihood fitting.

Attended school

CSC 2023 (Tartu)

Number of exercise hours

1

Number of lecture hours

1

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