

Search for missing materials in the LHCb simulation

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About me

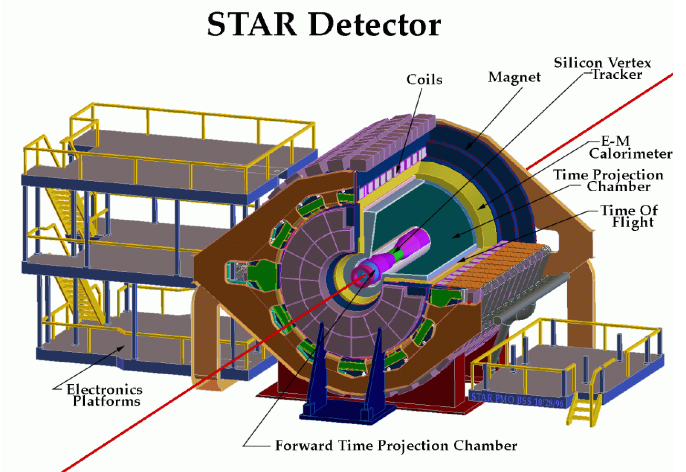
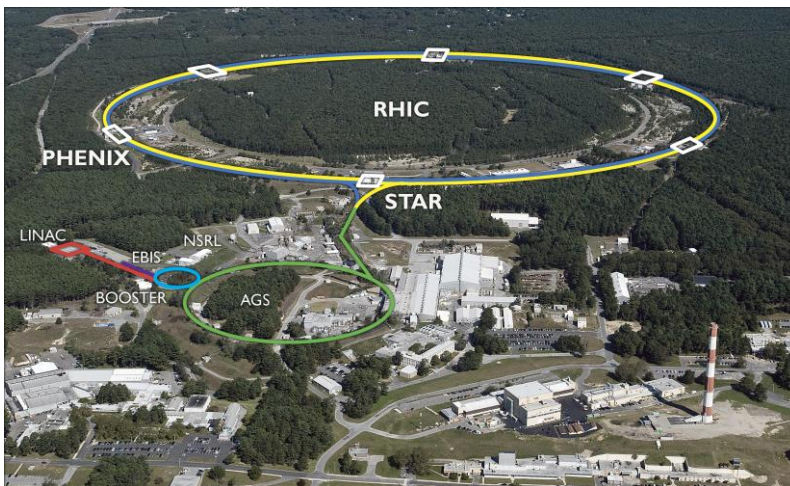


Beijing, China

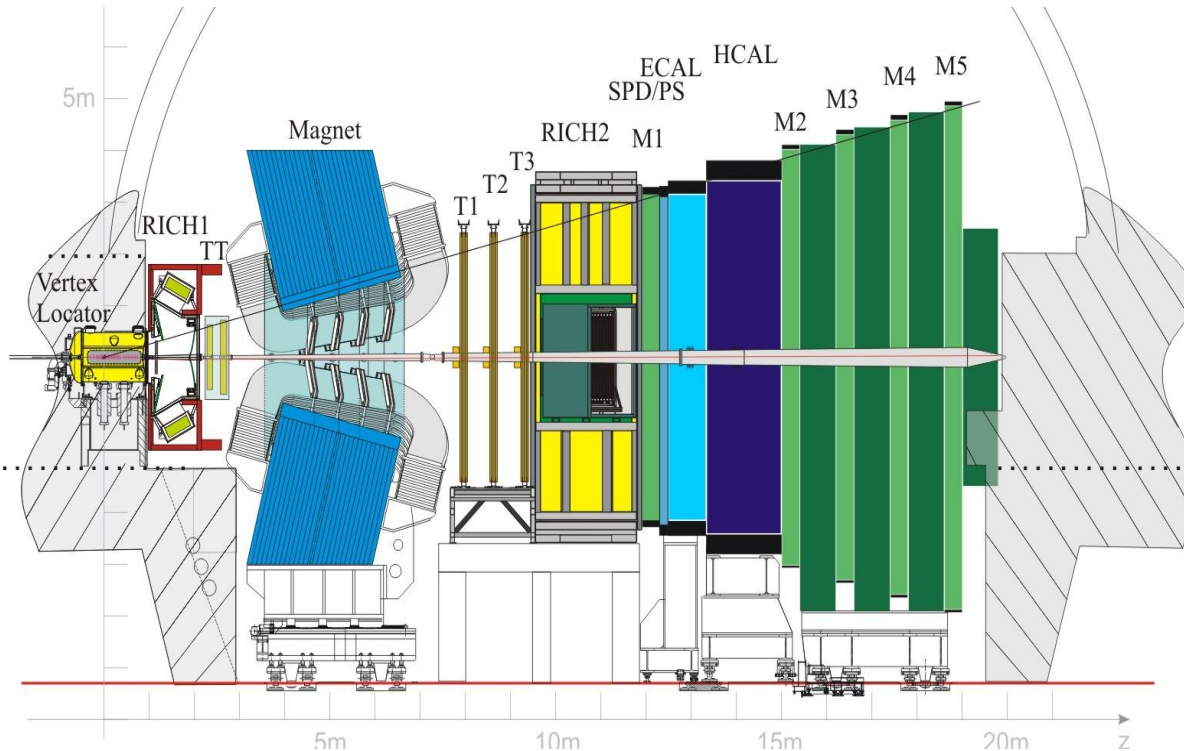
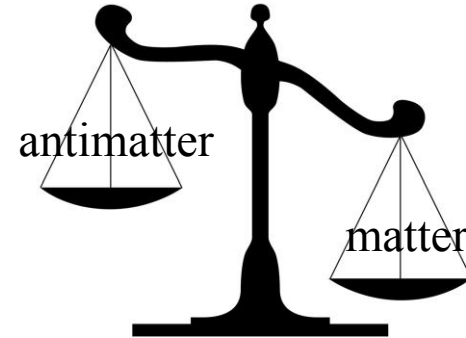
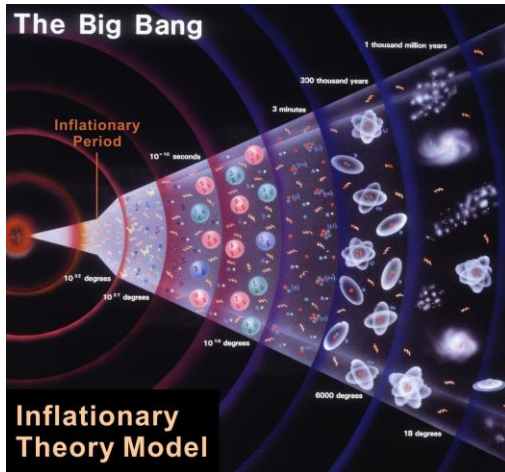


Tsinghua University

Finished 3rd year study as undergraduate before this summer.....



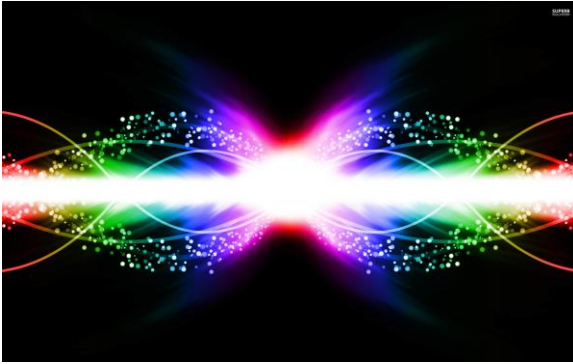
Introduction to LHCb



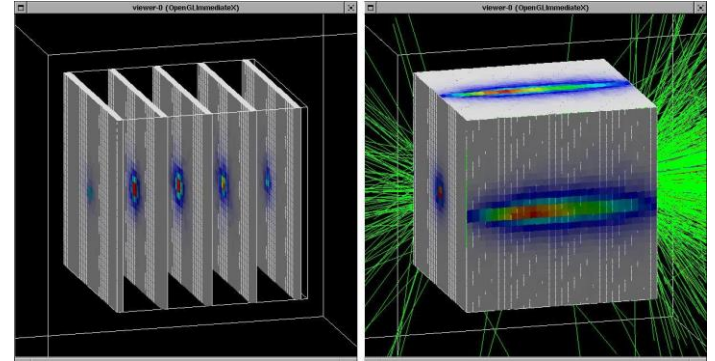
Single-arm forward spectrometer

Study of heavy flavor physics

About MC simulation



Generator: p-p collision



Response of detectors

Reliable simulation for :

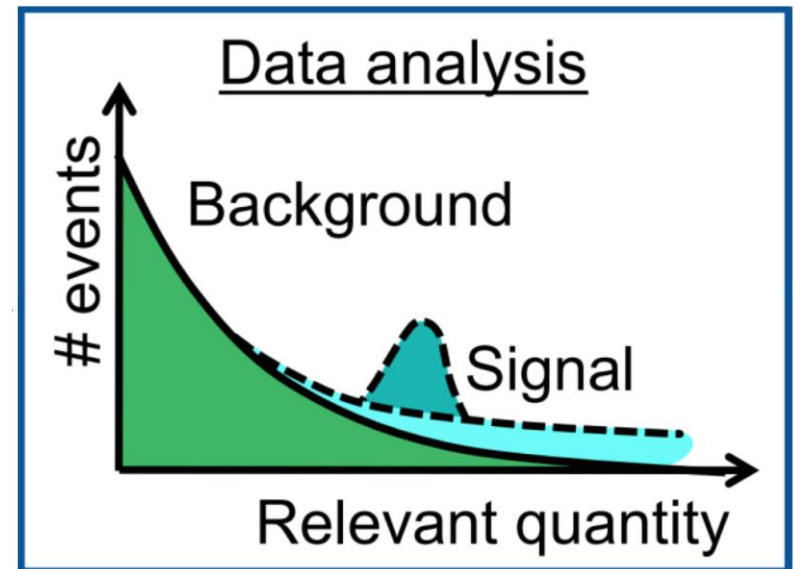
Data analysis

Efficiency estimate

Offline selection optimization

Online trigger optimization

Detector design

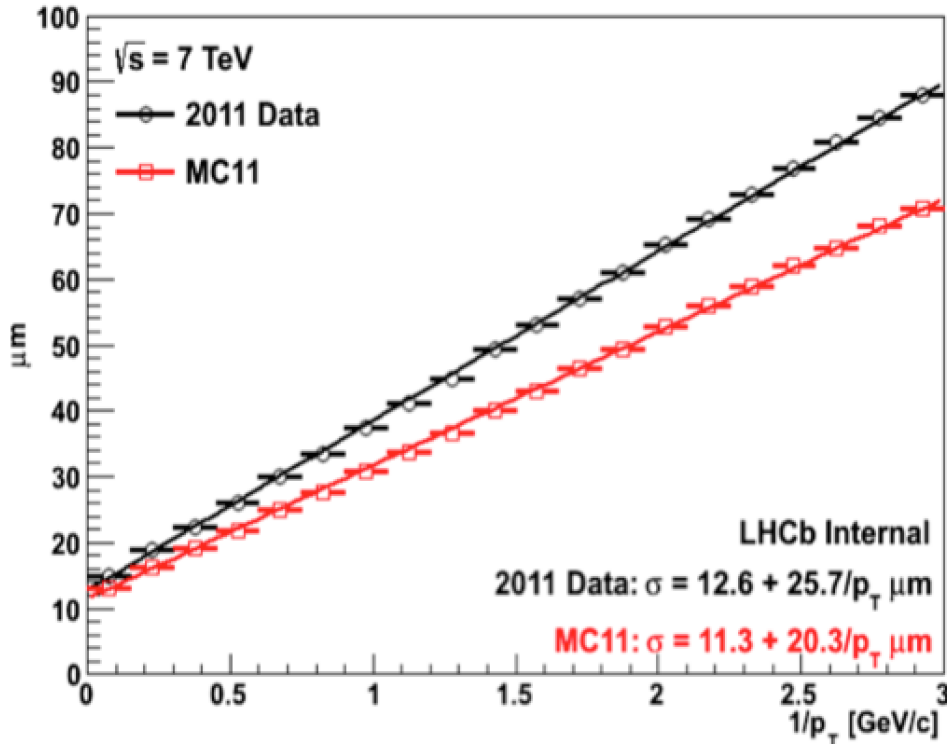


MC Validation

Data/MC comparison for validation

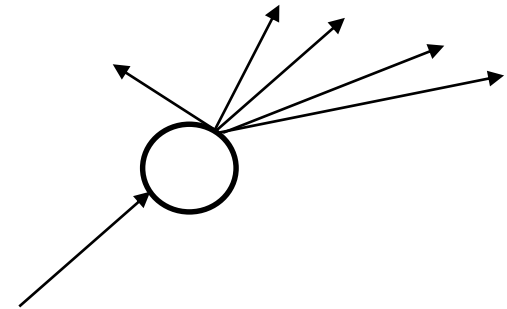
If MC/data disagree, tune MC

IP resolution in data/MC^[1]



- Generator
- Detector response

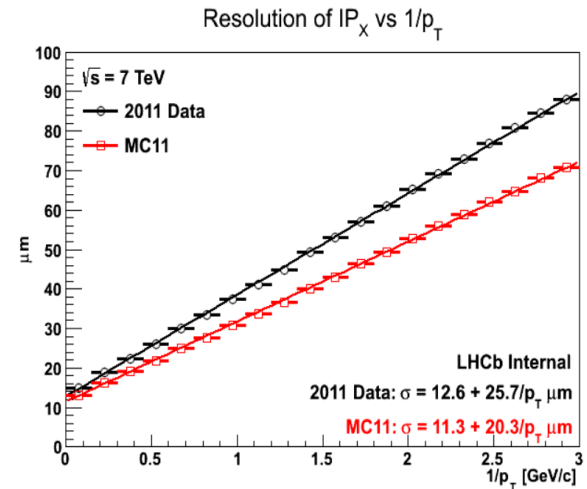
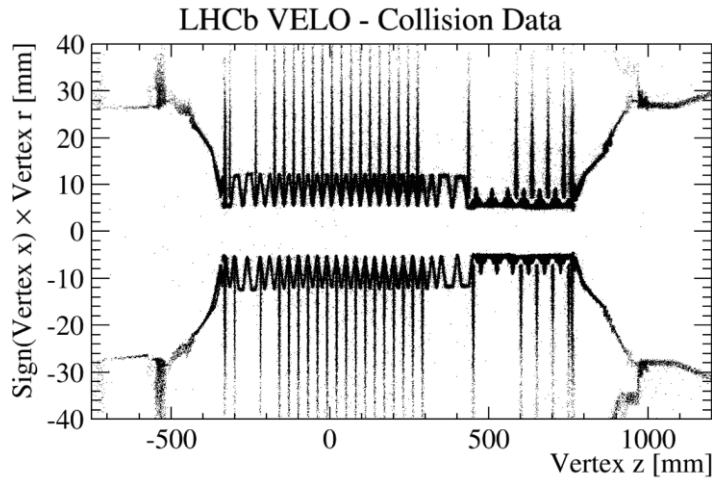
energy cut/threshold tuning
tomography



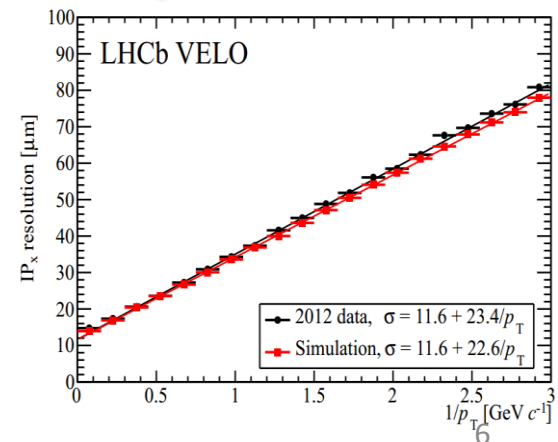
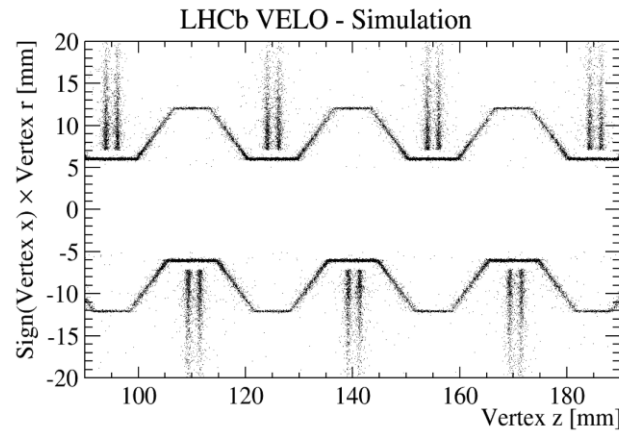
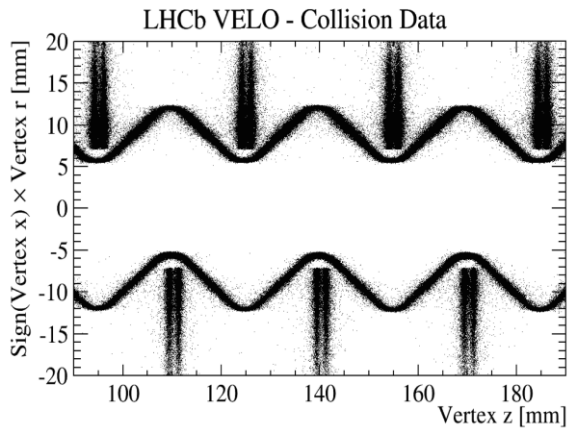
Before having well tuned MC, *smearing*, *reweighting*.....

Tomography

Hadron interaction vertex distribution in VELO^[2]

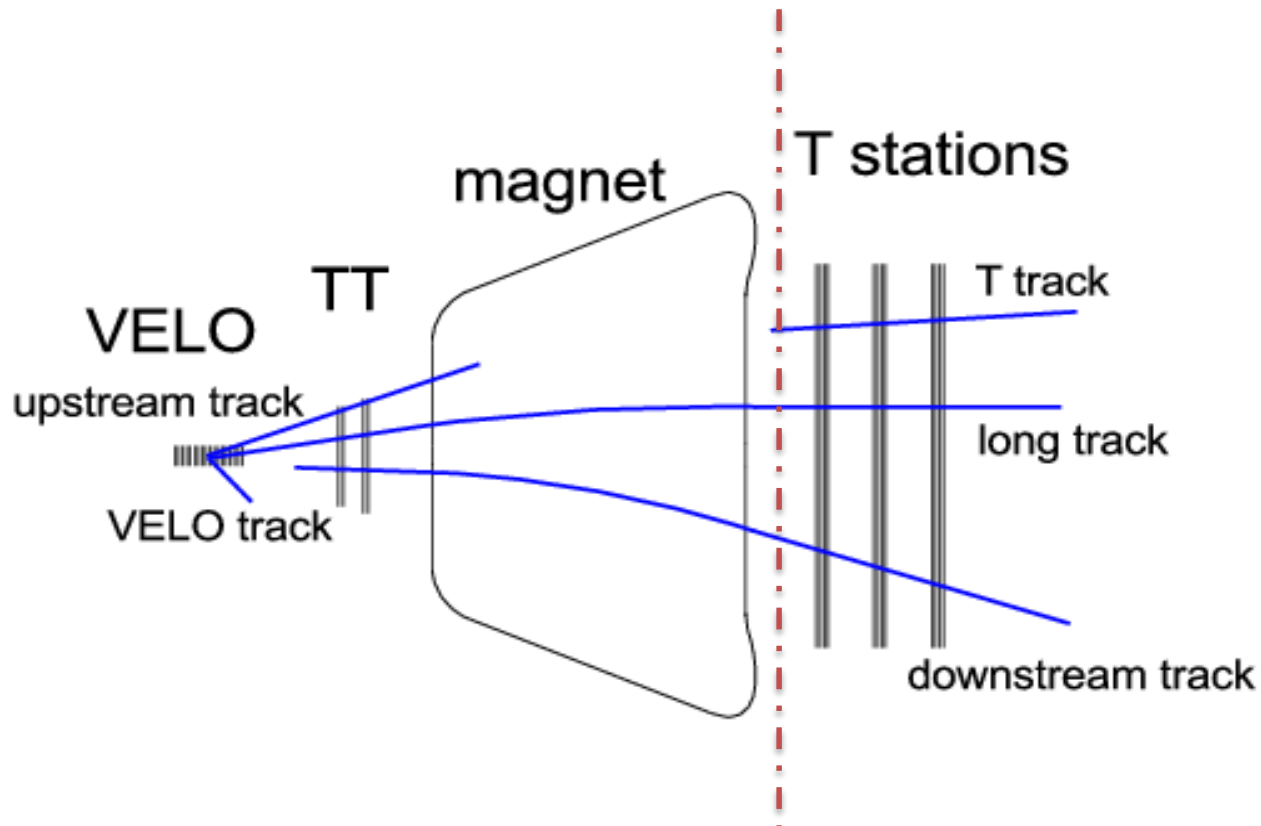


After improving
RF foil
description



Research background

Difficulties in downstream region:
Limited tracking, weak magnet

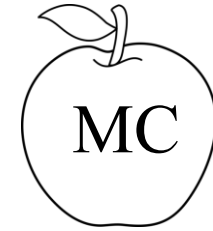


Even though we saw disagreement in data/MC multiplicity distribution....
Still an open question in LHCb

My progress & To do list

To locate the problem:
Hit map comparison

Disentangle:



Detector response

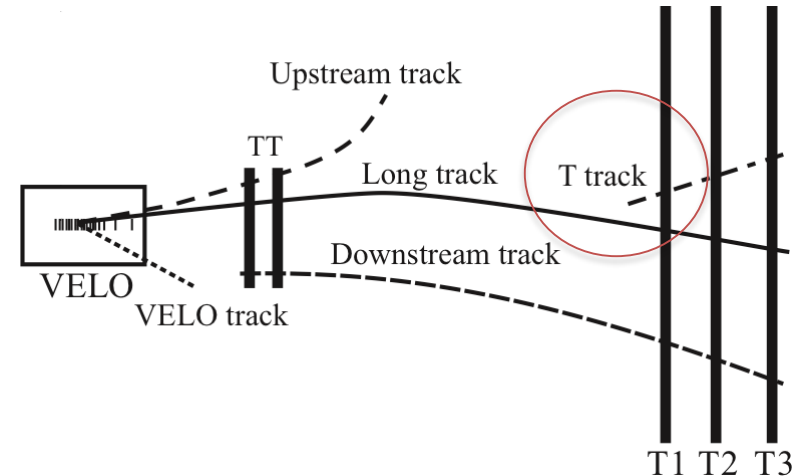


Generator

Missing materials?

Tomography

EDR / MC comparison



Tuning energy cut/threshold

Thank you for listening!