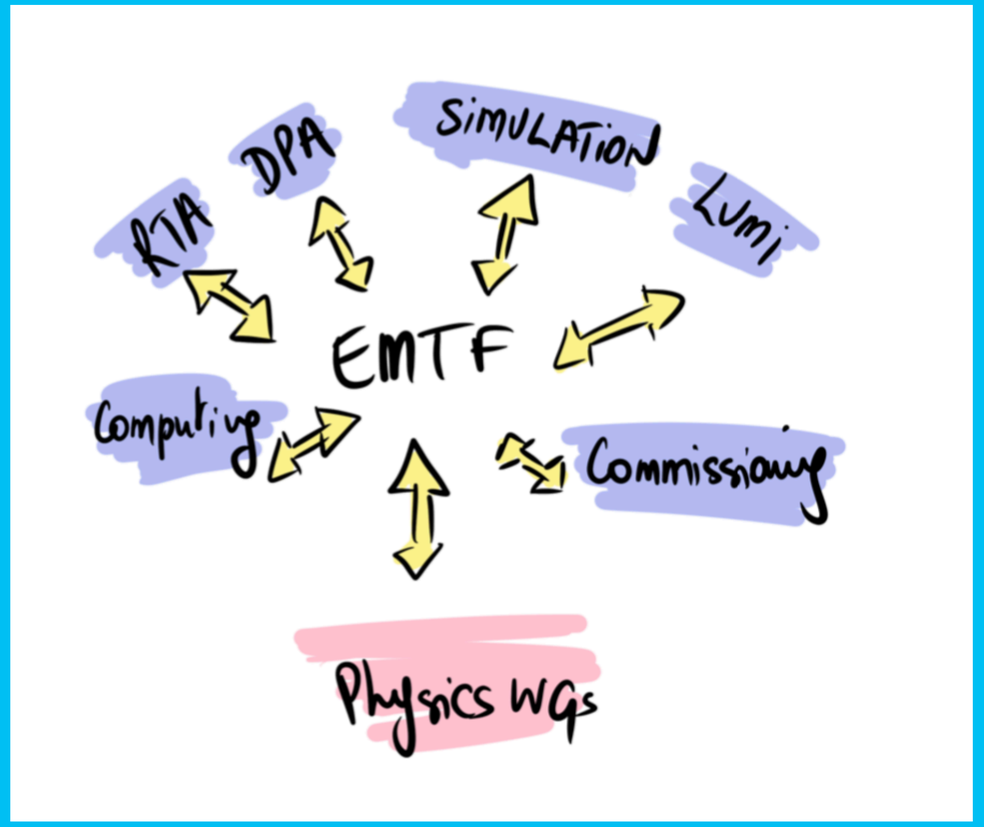
14.03.2022

EMTF 2022

Starter kit edition

Eva Gersabeck
Yasmine Amhis
Alessandro Scarabotto
Valeriia Lukashenko
Lukas Calefice



lhcb-physics-emtf-run3@cern.ch

THE EMTF CORE TEAM

Lukas/QEE

Dylan/Charm

Federica/Charm

Fidan/B2OC

Fionn/B2OC

Holly/SL

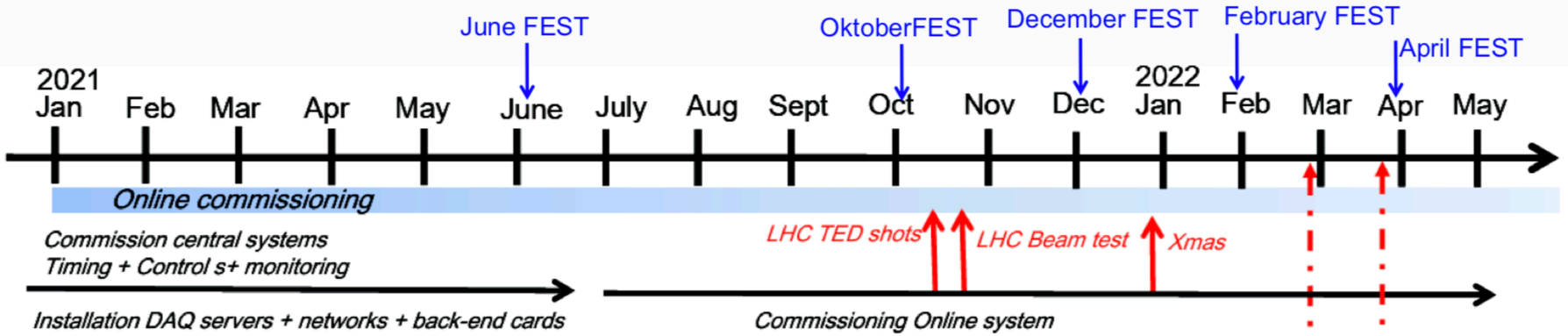
Valeriia/B2CC

Felicia/RD

Felicia/RD

Jialu/BandQ

OPG



RICH2 installation + commissioning

RICH1 mechanics

Beam pipe

RICH1 optics + comm

CALO commissioning

MUON commissioning

Scifi C + commissioning

Scifi A + comm

VELO C

Cosmic-rays

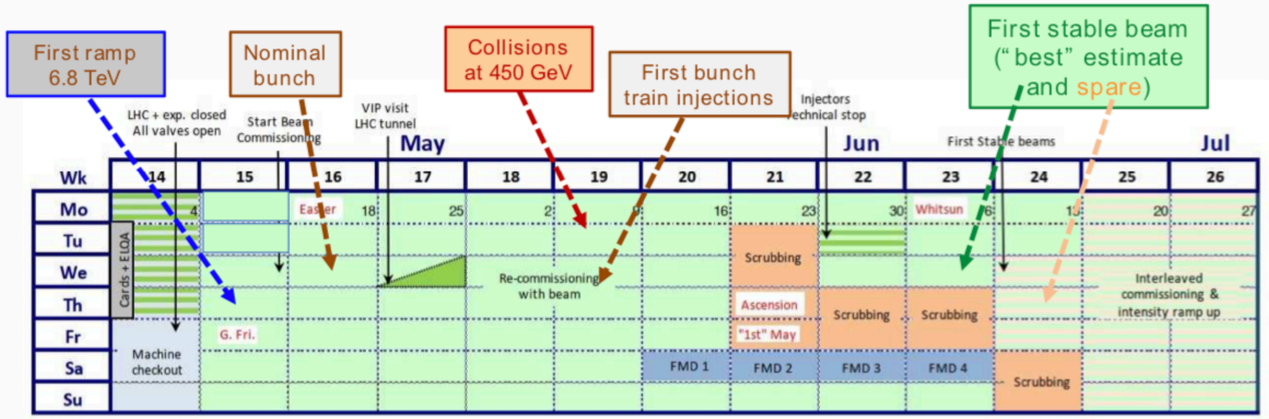
Beams!

We are here!

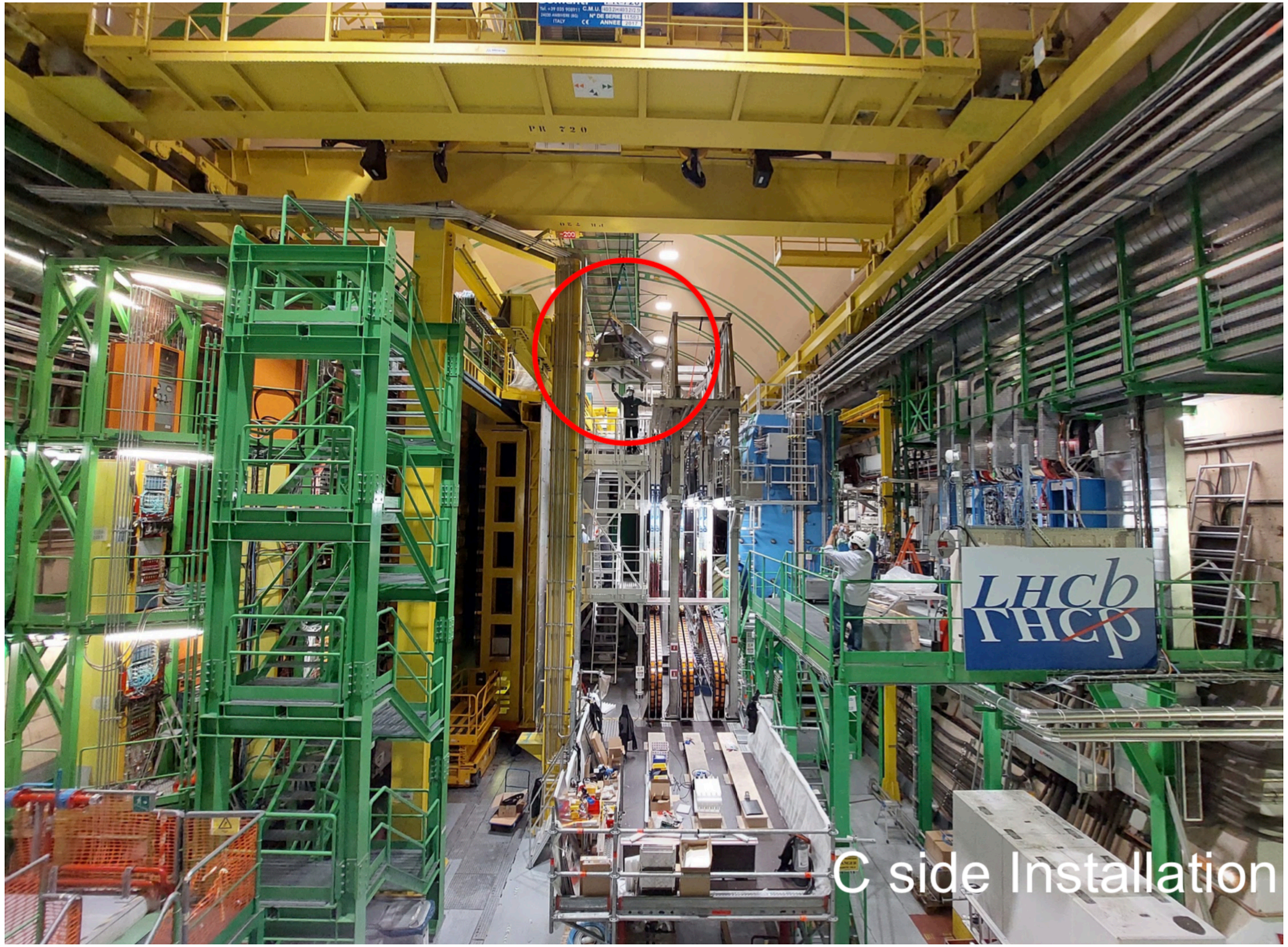
Cavern closure

Global Commissioning will have to wait a bit more

- RICH1+RICH2+MUON+CALO+PLUME+BCM+RMS commissioning advanced
- Advanced commissioning of online systems with particular attention to online infrastructure, clock, timing and controls
  - Now concentrating in making the central tools available for scans
- SciFi + VELO-C will finalize commissioning with beam
  - Profit from occasional accesses and occasional periods with no beam
  - Establish tight coordination with LHC to perform machine-experiments interface tests
  - VELO-C work preparatory for a speedy VELO-A commissioning when installed



- commissioning new Beam Conditions Monitor (BCM) hardware, logic and connection: test to trigger dumps and calibrate threshold in May
- commissioning calibration and operational procedures with sub-detectors and collisions:
  - early 450 GeV collisions will be used to repeat time alignment with higher precision
  - test calibration and operational procedures with HV/LV ON where possible; scans, central operations, trigger validation → very final scans to be at 6.8 TeV
- commissioning SMOG2
- commissioning of LHCb luminometer (PLUME) and its luminosity communication to LHC
- Commissioning of SciFi and VELO in the "central partition"
- Need to take time to validate the "VELO closing procedure" and its Velo Safety System (VSS)



P.Collins

MC REQUESTS

- Encourage people to make “small” requests for their analyses with: **VeloClosed+noUT** configuration.

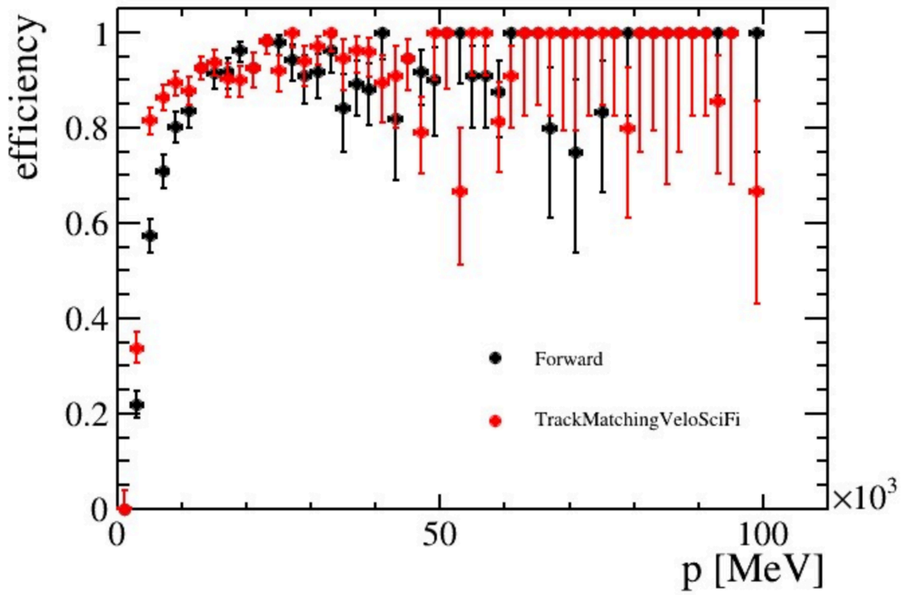
This will help to exercice the machinery and hopefully be the closest to what we will have for 2022.

MC REQUEST: STEP BY STEP

0. Check if your decay was already produced: list
1. Check if your EventType exists in the DecFiles project: link1 or link2
   - If not, follow the guide to submit your decay.dec
2. Define your request (events number mainly)
3. Send an email to vladimir.gligorov@cern.ch and alessandro.scarabotto@cern.ch specifying the decay (with EventTypes) and how many events per polarity
4. Follow the status of your request on Dirac (you will receive also automatic emails)

12

26/11/2021 Alessandro Scarabotto - Run3 Upgrade MC production and request



Alessandro's slides

Christina's Slides

MC REQUESTS

- Encourage people to make “small” requests for their analyses with: **VeloClosed+noUT** configuration.

This will help to exercice the machinery and hopefully be the closest to what we will have for 2022.

WE WILL DISCUSS WITH SIMULATION AND GIVE YOU THE GREEN LIGHT.

0. Check if yo
1. Check if yo
   - If not, follov
2. Define your request (events number mainly)
3. Send an email to vladimir.gligorov@cern.ch and alessandro.scarabotto@cern.ch specifying the decay (with EventTypes) and how many events per polarity
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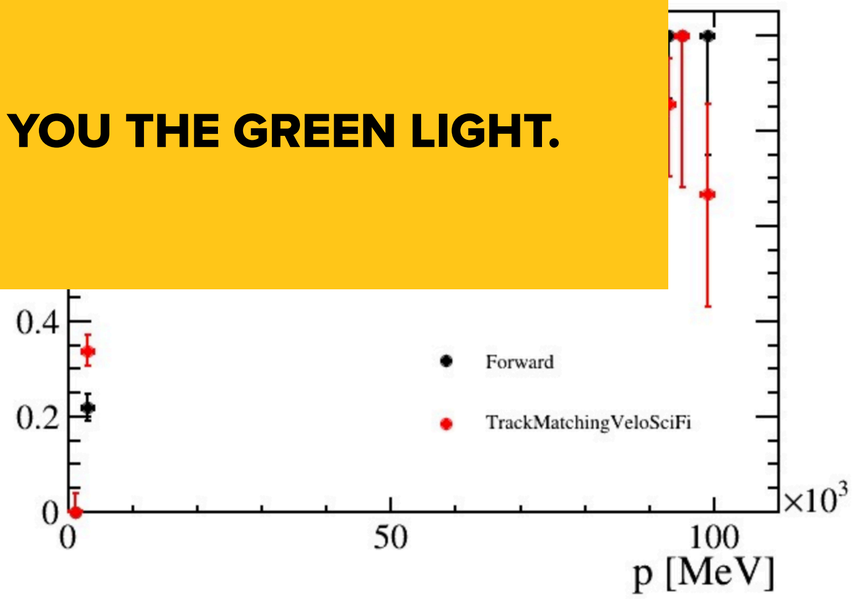


Alessandro's slides

Christina's Slides

Analysis preservation

https://gitlab.cern.ch/lhcb/100pbchallenge

We will provide templated and examples:

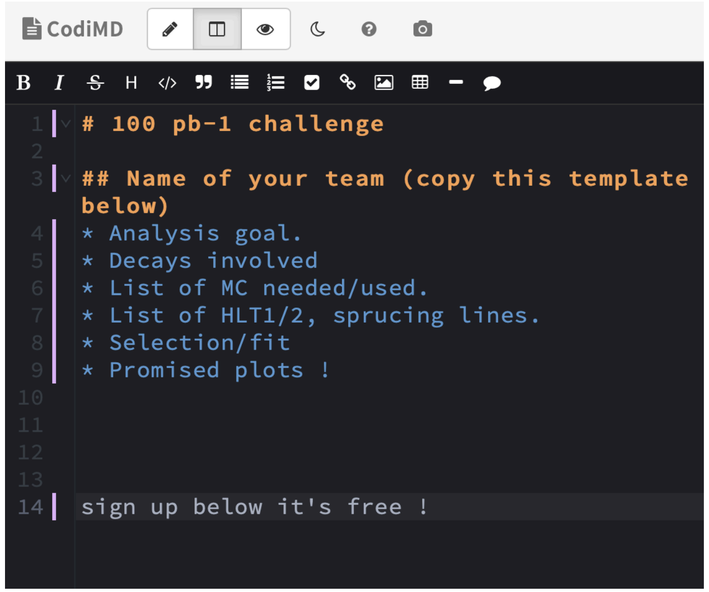
https://gitlab.cern.ch/lhcb-dpa/wp6-analysis-preservation-and-open-data/

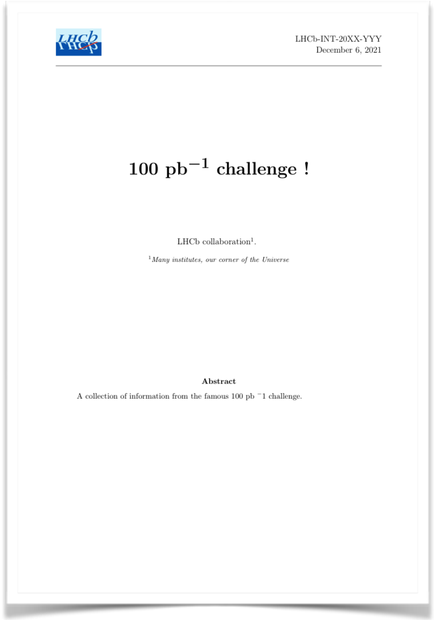
People are vividly(*) encouraged to:

- ☑ use **snakemake**
- ☑ use **analysis production** tools (dedicated session this week).
- ☑ Follow up REANA developments.

(*) Apply British understatement here.

USEFUL LINKS




LHCb-INT-20XX-YYY
December 6, 2021

$100\ \mathrm{pb}^{-1}$ challenge !

LHCb collaboration[1].

[1]*Many institutes, our corner of the Universe*

Abstract

A collection of information from the famous 100 pb $^{-1}$ challenge.

[egroup-lhcb-physics-emtf-100pbchallenge]

[HTTPS://CODIMD.WEB.CERN.CH/100PBCHALLENGE]

A very good opportunity to understand the performances of the detector across the LHCb physics phase space.

WELCOME TO THE LHCB STARTERKIT!

The organisers of the Run 3 edition:

Alessandro Scarabotto (LPNHE)

Valeriia Lukashenko (NIKHEF/KINR)

Lukas Calefice (Dortmund/LPNHE)

With a lot of help from Yasmine and Eva & all teachers and helpers of the sessions!

See mail via indico for zoom link

https://indico.cern.ch/event/1124730/

THE SCHEDULE

Time (CET)	Monday	Tuesday	Wednesday	Thursday	Friday
11:00-12:00		HLT2 line development Marian	DaVinci & FunTuple Abhijit & Davide	HLT Efficiency Checker Ross	Allen & HLT1 Roel
12:00-12:30					
12:30-13:00					
13-14	Early Measurements EMTF				
14:00-14:30		Fionn			
14:30-15:00		Run 3 data flow @ the Tuesday meeting zoom here			Dylan Analysis Productions
15-16		Sprucing Nicole			
16-17					

- Instructions on monitoring of HLT2 lines are postponed as the configuration is still in development

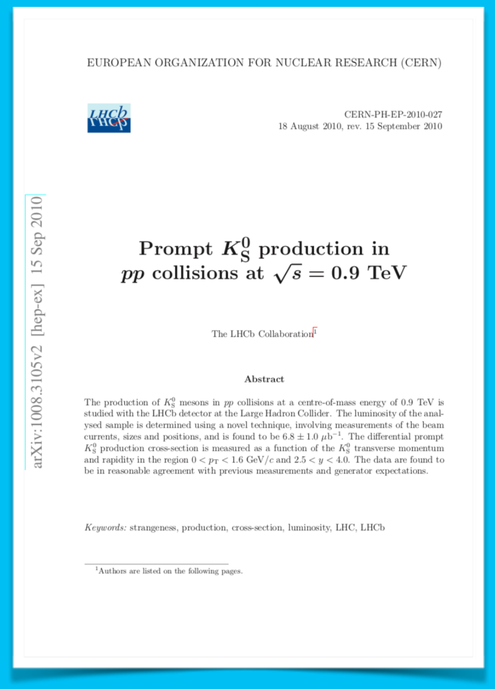
PRACTICAL INFORMATION

- Questions that are relevant for everyone should be ask in the zoom session.
- Join our Helpdesk mattermost channel:
  https://mattermost.web.cern.ch/starterkit/channels/run-3-starterkit-2022-helpdesk
  → debugging questions or technical issues can be posted there
- All sessions will be recorded and be made available on CDS Videos
  - the link to the recordings will be shared via indico mail
- Download stack build tarball from:
  `/eos/lhcb/user/there-will-be-a-link/stack.tar.gz`
  → need to run `tar -zxvf stack.tar.gz` & `make Moore` afterwards
- See this collection of useful documentation references:
  https://codimd.web.cern.ch/QCc26-TmQgCaP6AXDgVYmA

You can contact us directly on mattermost or via email if you have organisational questions or comments!

Enjoy Run 3 Starterkit!

A BIT OF ARCHEOLOGY



EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH (CERN)

CERN-PH-EP-2010-027
18 August 2010, rev. 15 September 2010

arXiv:1008.3105v2 [hep-ex] 15 Sep 2010

Prompt K^0_S production in pp collisions at $\sqrt{s} = 0.9$ TeV

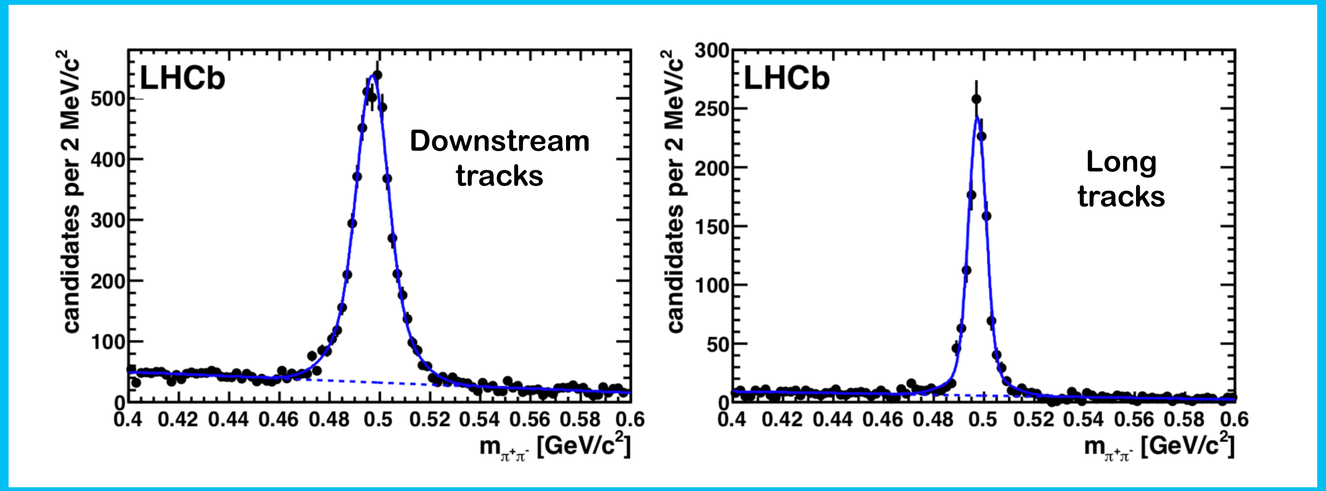
The LHCb Collaboration[1]

Abstract

The production of K^0_S mesons in pp collisions at a centre-of-mass energy of 0.9 TeV is studied with the LHCb detector at the Large Hadron Collider. The luminosity of the analysed sample is determined using a novel technique, involving measurements of the beam currents, sizes and positions, and is found to be $6.8 \pm 1.0\ \mu b^{-1}$. The differential prompt K^0_S production cross-section is measured as a function of the K^0_S transverse momentum and rapidity in the region $0 < p_T < 1.6$ GeV/c and $2.5 < y < 4.0$. The data are found to be in reasonable agreement with previous measurements and generator expectations.

Keywords: strangeness, production, cross-section, luminosity, LHC, LHCb

[1]Authors are listed on the following pages.



During the 2009 run, low intensity beams collided in LHCb at the LHC injection energy, corresponding to a total energy of 0.9 TeV. Due to the dipole magnetic field the beams have a crossing angle that results in the pp centre-of-mass frame moving with velocity $0.0021c$ in the $-x$ direction. Both the beam sizes and crossing angle were larger than those designed for high-energy collisions. In order not to risk the safety of the VELO, the 2009 data were recorded with the two VELO halves positioned 15 mm away from their nominal data-taking position (VELO partially open), resulting in a reduced azimuthal coverage. For this run, the magnetic dipole field was pointing downwards.

Integrated luminosity 6.9 micro barns.
Center of mass energy 0.9 TeV

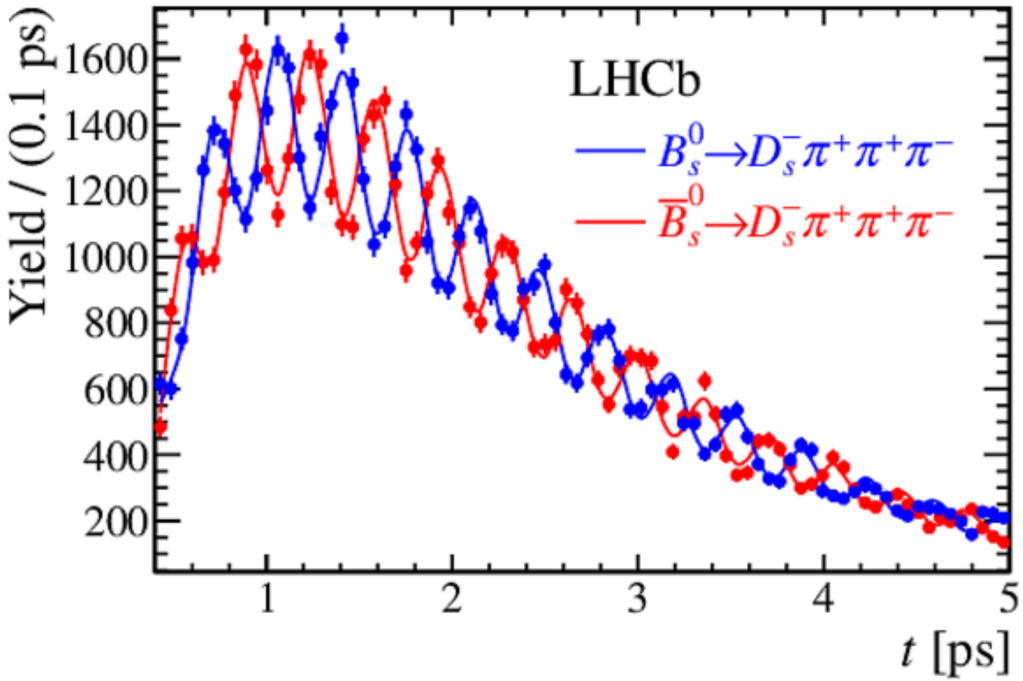
“Bah, 2022 will be a commissioning year"

“Well, yes but no, not just.”

“Goal is to reach steady running by Autumn ”

Unknowns

Unknowns



We might need to iterate some steps.
But progress is not linear.

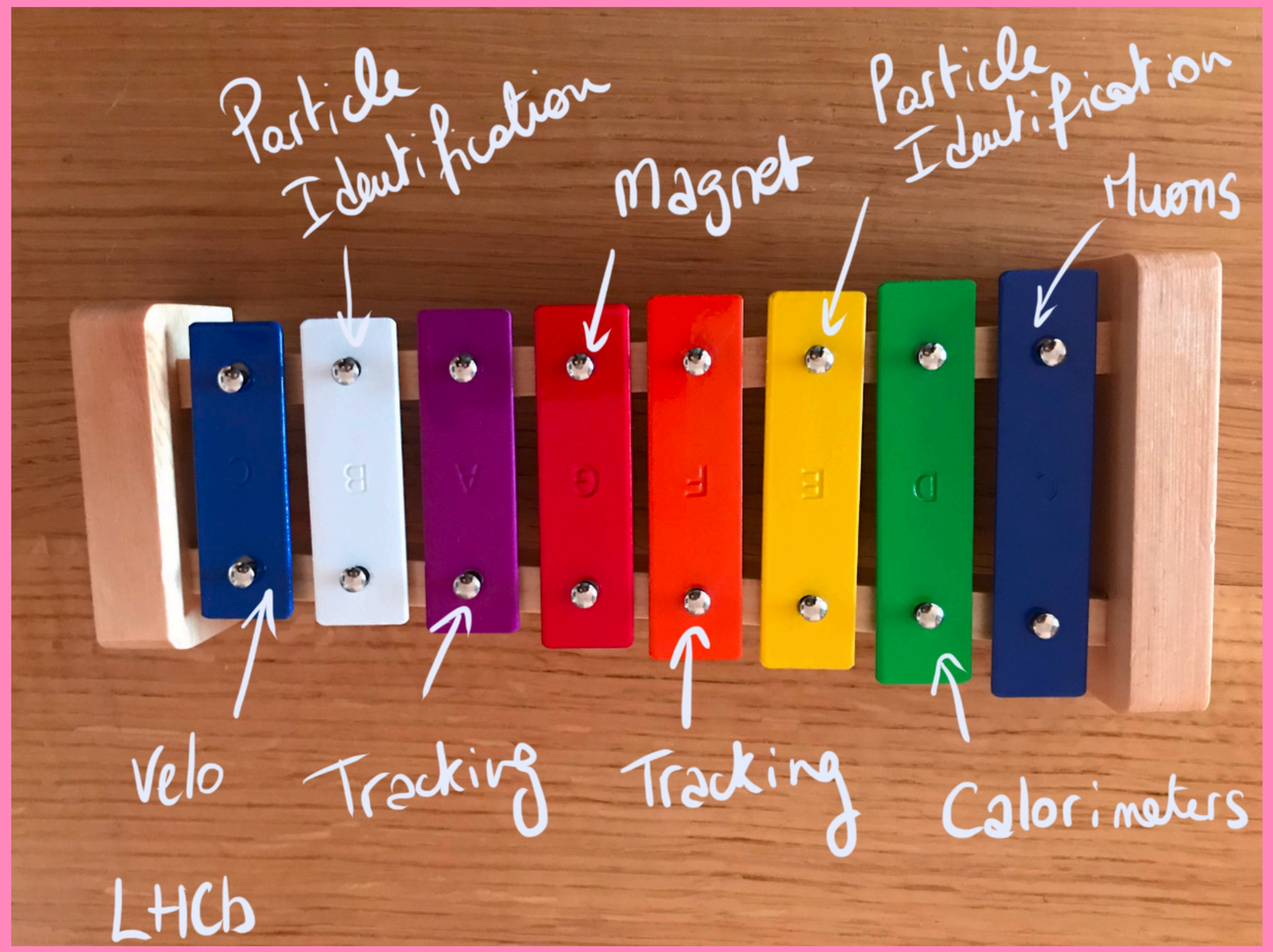
WHERE TO FIND US

- Our Twiki Page.
- Our Mattermost

OUR ROLE

- Follow closely the first data taking (very soon) and ensure that “everything” will be in place for early measurements and further key channels.

THAT'S ALL FOR TODAY !



Revised 2023 offline resources

- Strategy for 2022+2023
  - We have been pledged nearly all the 2022 resources we requested for, assuming a full data taking year
  - In 2022 we will take data for less time and lower luminosity
    - Storage requirement decrease
    - CPU requirements decrease (less data → less events to simulate)
  - Nevertheless, data taking in 2022 is going to be “bumpy”
    - We have enough contingency for commissioning
    - A good chunk of data will be “transient”
  - → (re-)use part of 2022 storage in 2023
  - → Procurement can be delayed, if helpful for funding agencies
  - → Effectively delaying the “big” step to 2024

SPECIAL RUNNING CONDITIONS

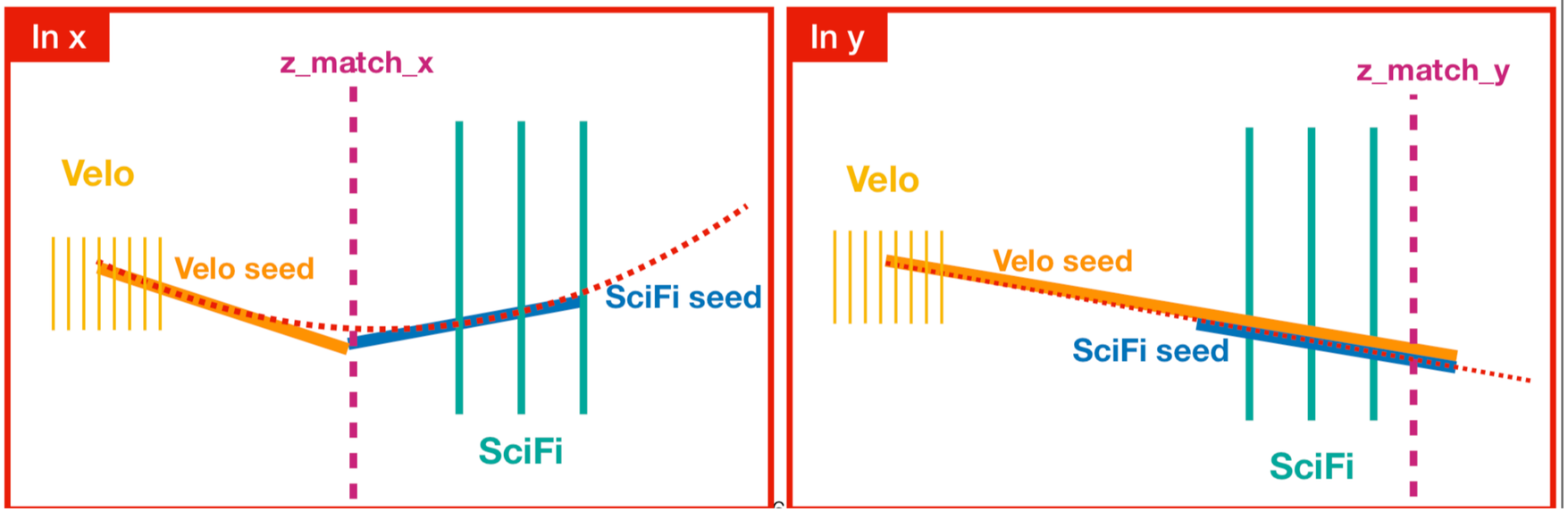
- We contacted the PWG to know if for their program there is a need of a special running condition such as a value of mu. If so please let us know.

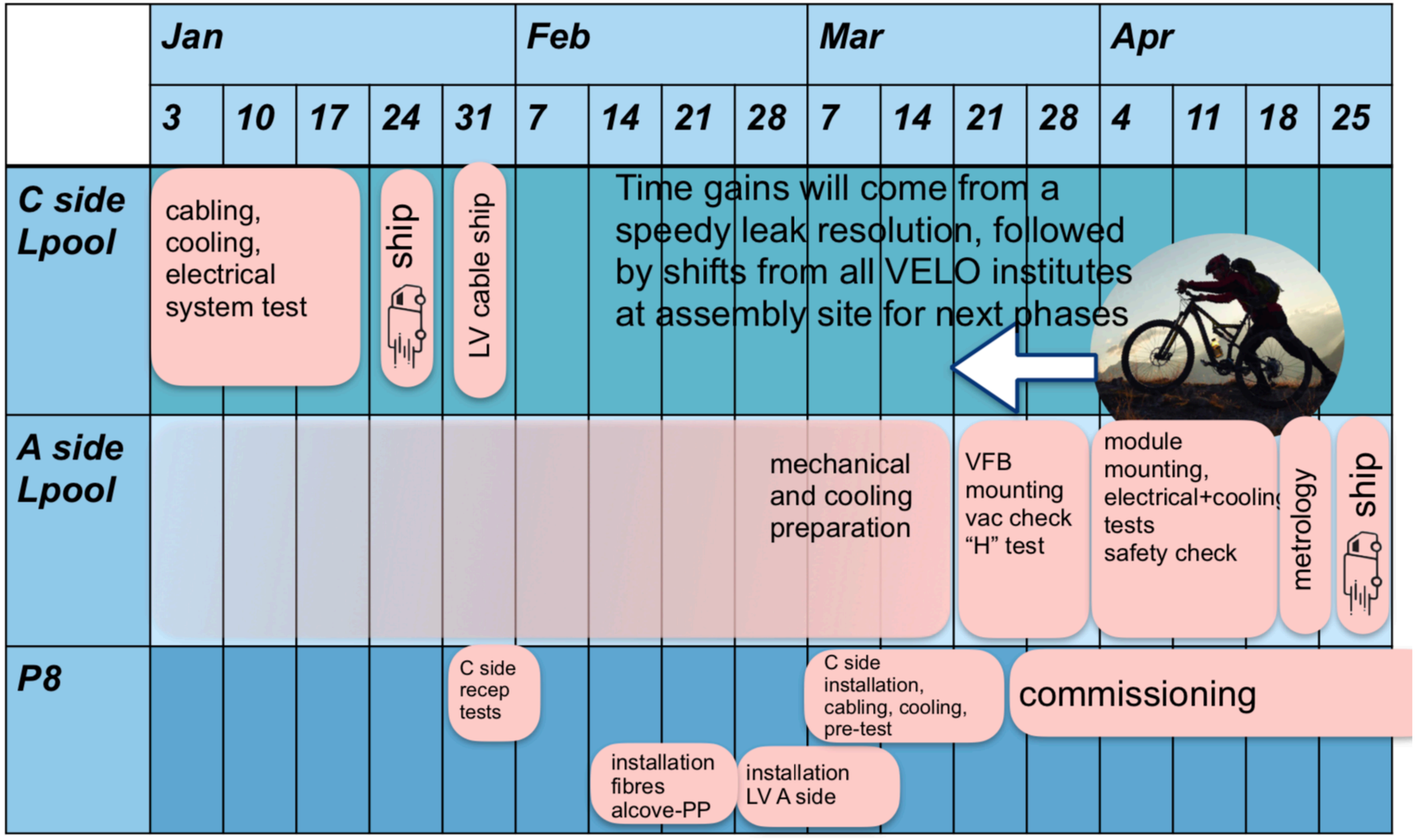
DIFFERENT OUTPUT FILES

- Definition of the different output file types:
  - SIM: only the Gauss simulation part
  - DIGI: samples with Boole digitization
  - XDIGI: extended info from Gauss saved in a DIGI file (you can re-run Boole for example)
  - (μ)DST: sample with reconstruction information (Moore or Brunel)
  - XDST: extended info saved from Gauss and Boole (possible to re-run Boole or Moore/Brunel)
  - LDST: sample with reconstruction and additional linker tables stored (useful for tracking studies for example pattern recognition, clusters info, …)
  - MDF: samples emulating the real data taking samples (used for software development studies for example in Allen)

The track matching algorithm

- Code adapted from PrMatchNN in HLT2 (thank you Sevda and Michel!)
- Two main inputs: **SciFi** and **VELO** seeds
- Algorithm approach:
  - "Kink" approximation: Velo/SciFi seeds extrapolated to matching position as straight lines
  - Magnetic field and bending in y parametrised with truth simulation to calculate z_match(x,y)

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C side Lpool
A side Lpool
P8
cabling, cooling, electrical system test
ship
LV cable ship
Time gains will come from a speedy leak resolution, followed by shifts from all VELO institutes at assembly site for next phases
mechanical and cooling preparation
VFB mounting vac check "H" test
module mounting, electrical+cooling tests safety check
metrology
ship
C side recep tests
installation fibres alcove-PP
installation LV A side
C side installation, cabling, cooling, pre-test
commissioning