
LHCb highlights:

2' slides + 2' video

Stafoverleg, 9 Mar 2020

VELO, SciFi, Trigger

The module production team agrees that Stycast and catalyst 23LV is the best option.

Module production is expected to restart in the second half of March.

• VELO:

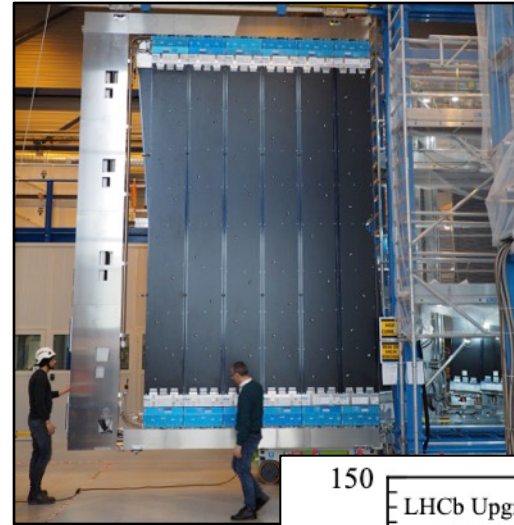
- ✓ Glue decision made
- ✓ RF foil
- ❖ Pollution of cooling plant

- Machining finished on all foils
- C2 & A2 etched to 150-200 micron.
- C1, C2, A2 & A3 are Torlon coated and have pt100's
- A1, C1, C2 & A2 are NEG coated.

"strongly advised not to circulate CO₂ in detectors"

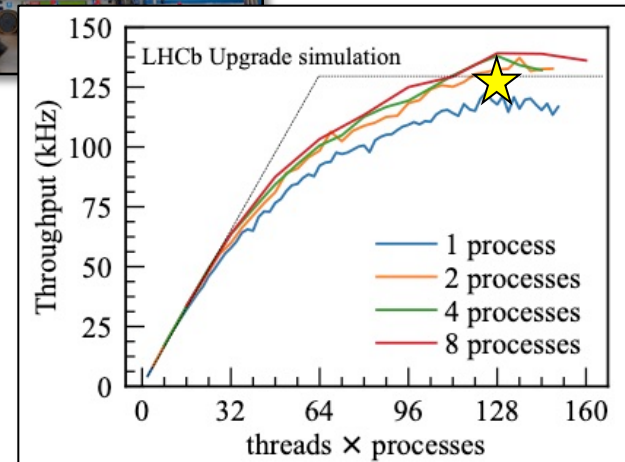
• SciFi:

- ✓ 1st C-frame commissioned
- ❖ Beampipe installation foreseen in May
- ❖ 6 C-frames on other side only ready July



• Trigger:

- ✓ CPU version of HLT1 reaches 125 kHz on AMD server (thanks Tristan Suerink!)
 - per node, scaling to 128 threads, utilising all 64 physical cores
 - For HLT1+HLT2 we will have O(1000) nodes
- Decision to go for CPU or GPU soon



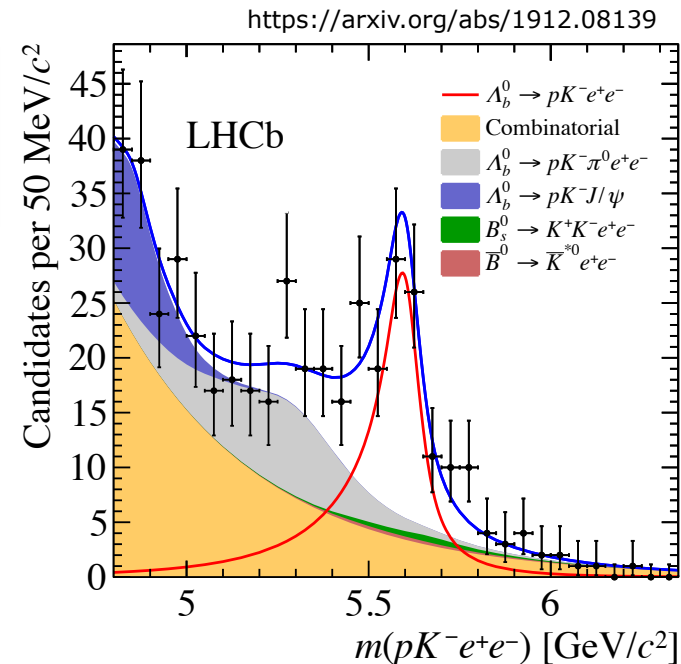
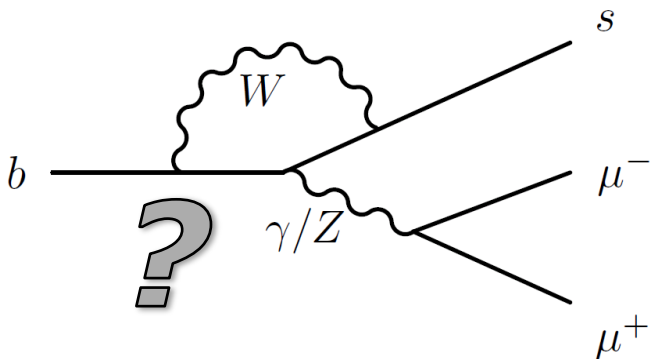
Flavour Physics in 2020:

- 1) New baryon states
- 2) Input for γ
- 3) Measurement of $|V_{cb}|$
- 4) World-best limit for $K_S^0 \rightarrow \mu^+ \mu^-$
- 5) Search for CP, and observation of P violation in Λ_b^0 decay
- 6) Test of lepton-universality in $\Lambda_b^0 \rightarrow pK\mu^+\mu^- / \Lambda_b^0 \rightarrow pKe^+e^-$

Observation of a new baryon state in the $\Lambda_b^0 \pi^+ \pi^-$ mass spectrum
Measurement of CP observables in $B^\pm \rightarrow DK^\pm$ and $B^\pm \rightarrow D\pi^\pm$ with $D \rightarrow K_S^0 K\pi$ decays
Measurement of $ V_{cb} $ with $B_s^0 \rightarrow D_s^{(*)-} \mu^+ \nu$ decays
Test of lepton universality using $\Lambda_b^0 \rightarrow pK^- \ell^+ \ell^-$ decays
Strong constraints on the $K_S^0 \rightarrow \mu^+ \mu^-$ branching fraction
Measurement of the branching fraction of the decay $B_s^0 \rightarrow K_S^0 K_S^0$
Search for CP violation and observation of P violation in $\Lambda_b^0 \rightarrow p\pi^- \pi^+ \pi^-$ decays

$$R_{pK} |_{0.1 < q^2 < 6 \text{ GeV}^2/c^4} = 0.86_{-0.11}^{+0.14} \pm 0.05$$

Agrees with SM and with measurements of R_K, R_{K^*}



NEWS

7) Limit on $\text{BF}(B_s^0 \rightarrow e^+ e^-)$

Today

$$\mathcal{B}(B_s^0 \rightarrow e^+ e^-) < 9.4 (11.2) \times 10^{-9}$$

8) New result on angular distributions in $B^0 \rightarrow K^{*0} \mu^+ \mu^-$

Tomorrow

LHC Seminar

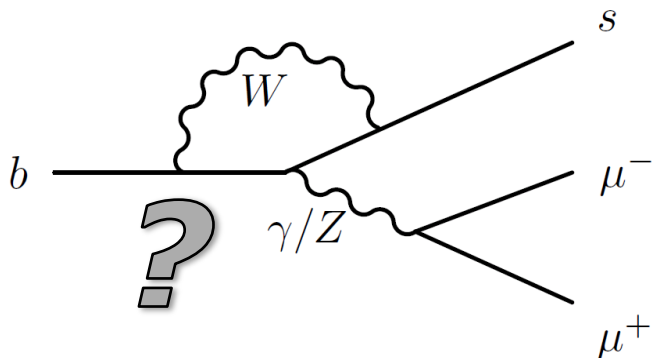
Updated angular analysis of the decay $B^0 \rightarrow K^{*0} (\rightarrow K^+ \pi^-) \mu^+ \mu^-$

by Eluned Anne Smith (Rheinisch Westfaelische Tech. Hoch. (DE))

 Tuesday 10 Mar 2020, 11:00 → 12:00 Europe/Zurich

 503/1-001 - Council Chamber (CERN)

Description Following CERN rules, registration is mandatory to attend the event.
[Coronavirus: information, measures and recommendations.](#)



NEWS

Today

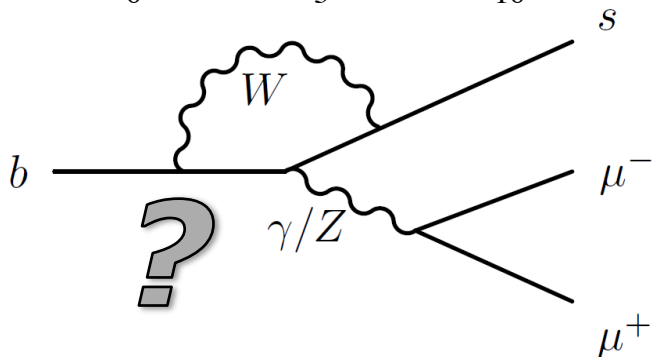
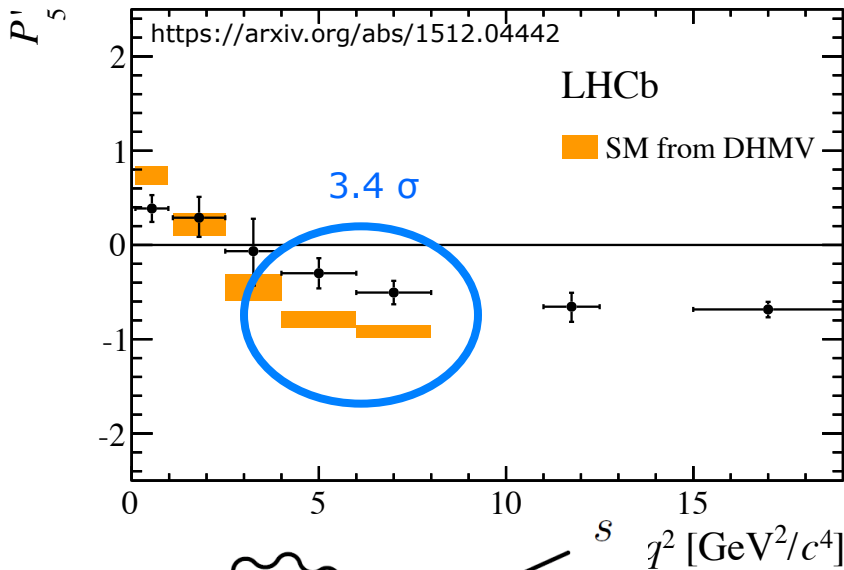
7) Limit on $\text{BF}(B_s^0 \rightarrow e^+ e^-)$

$$\mathcal{B}(B_s^0 \rightarrow e^+ e^-) < 9.4 (11.2) \times 10^{-9}$$

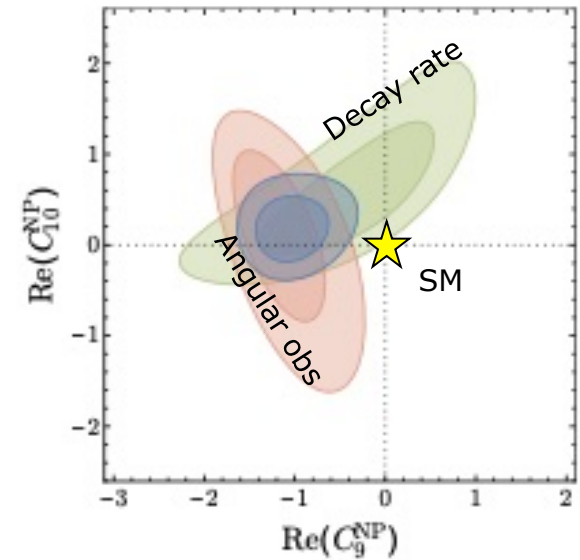
8) New result on angular distributions in $B^0 \rightarrow K^{*0} \mu^+ \mu^-$

Tomorrow

Remember run-1 result:

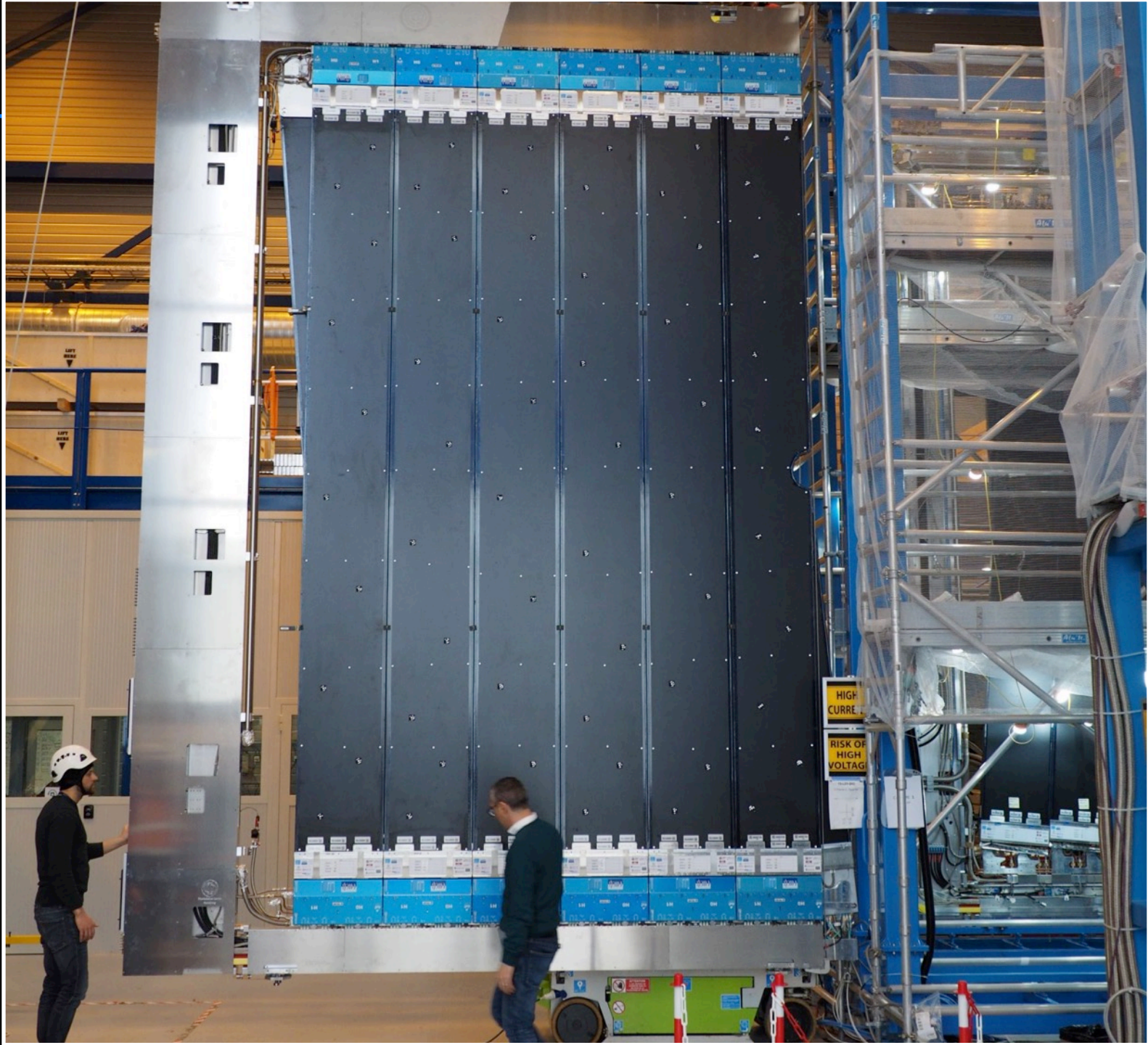


Implications:



Altmanshofer & Straub
<https://arxiv.org/abs/1503.06199>
<https://arxiv.org/abs/1903.10434>

C_9^{NP} : New effective vector coupling from eg. vector leptoquarks



<https://youtu.be/7bX-GTjISDY>

