

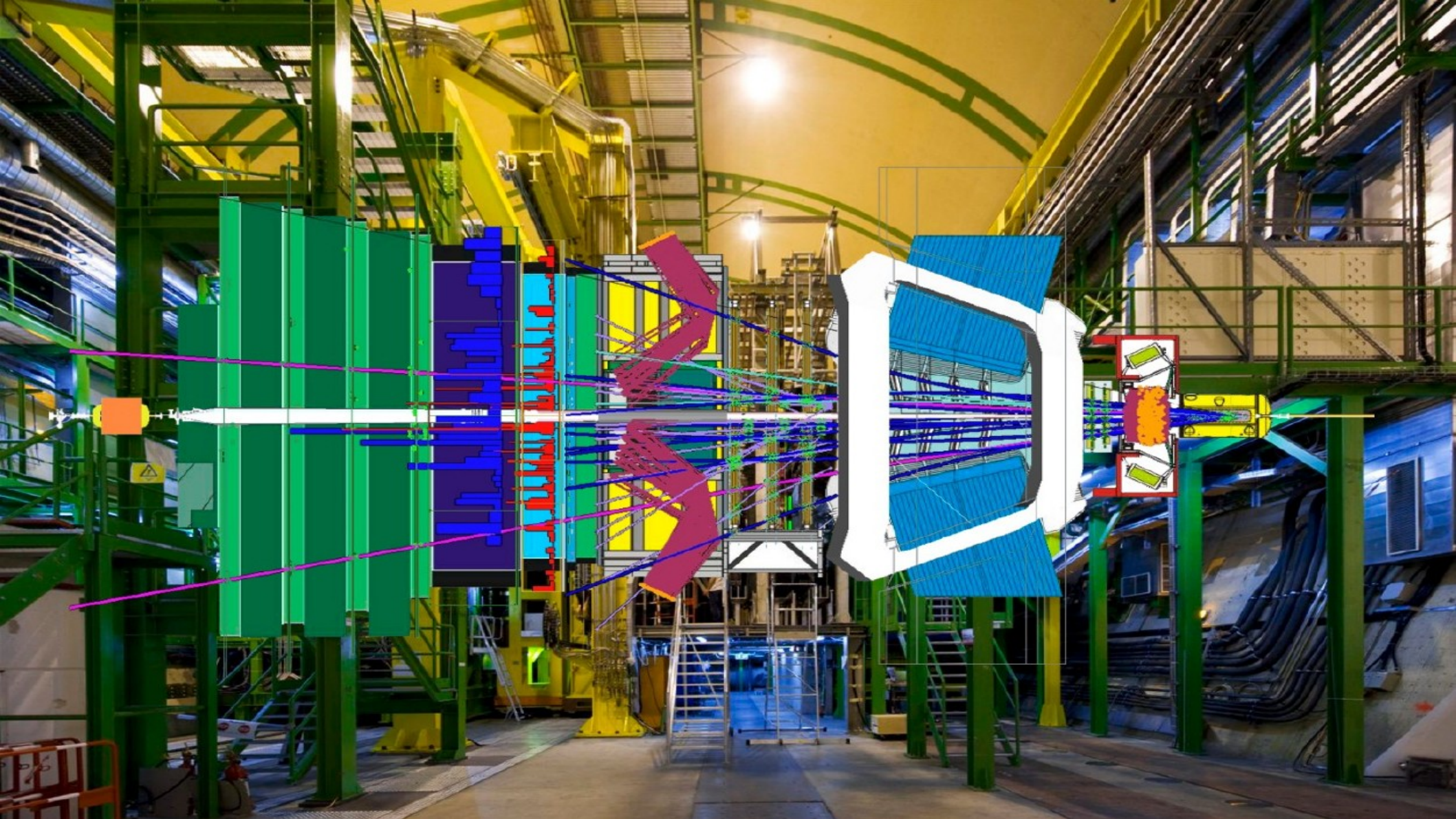
Die Heidelberger LHCb Gruppe am Physikalischen Institut



Gruppenleiter:
Prof. Dr. Stephanie Hansmann-Menzemer & Prof. Dr. Ulrich Uwer

Der LHCb Detektor am CERN

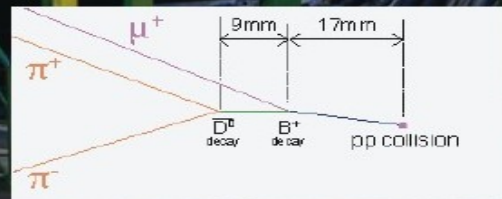
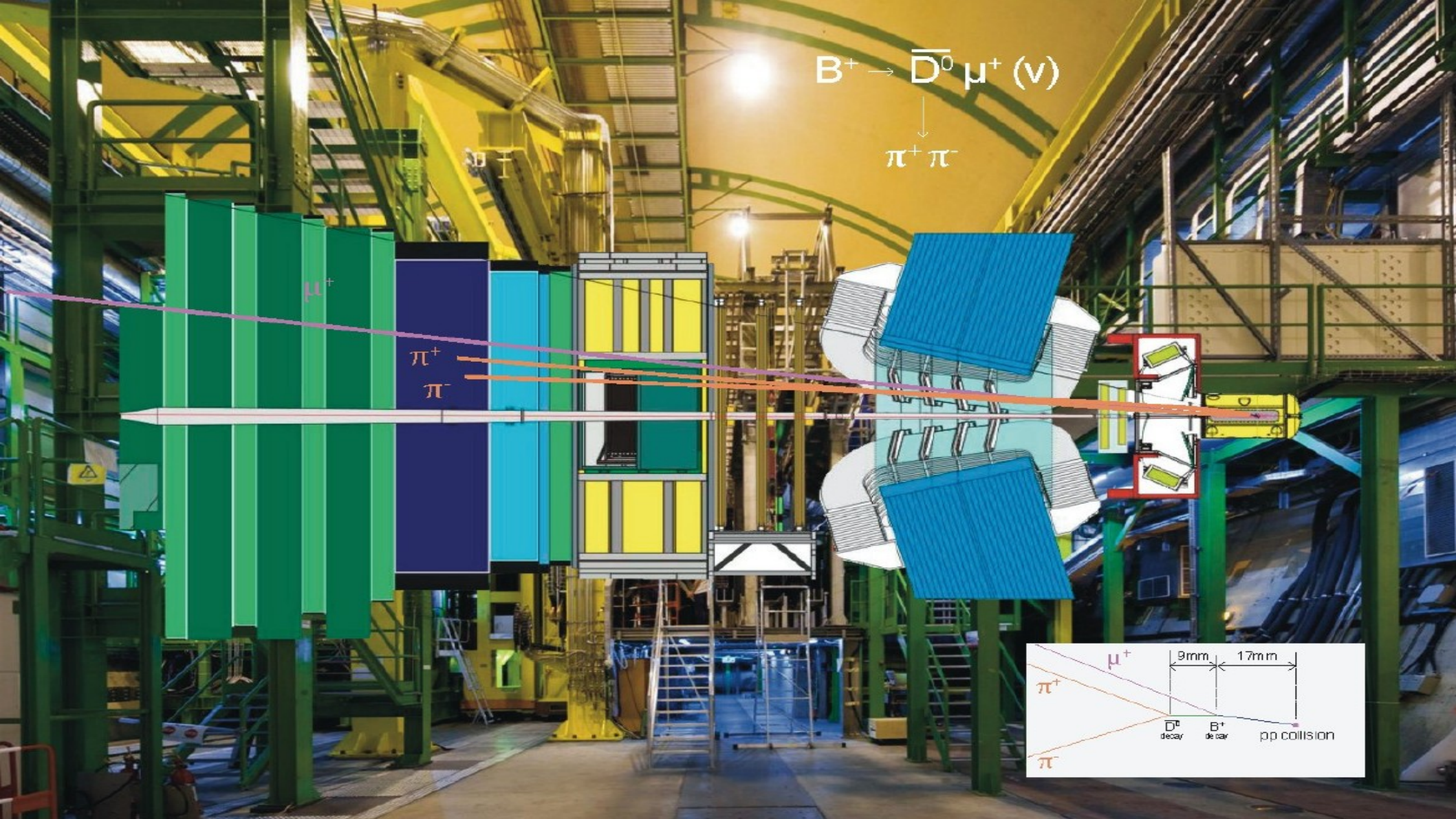




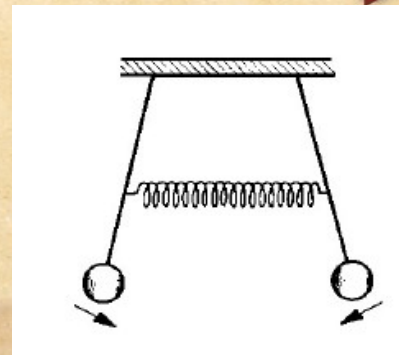
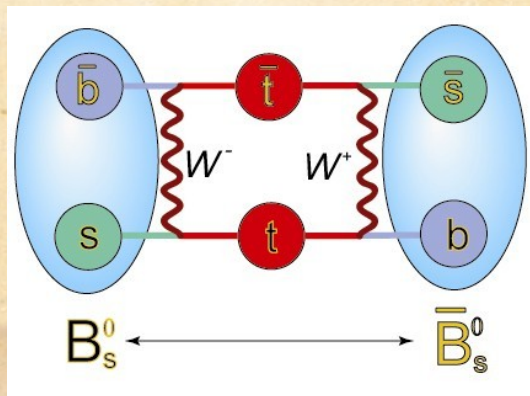
$$B^+ \rightarrow \bar{D}^0 \mu^+ (\nu)$$

$$\downarrow$$

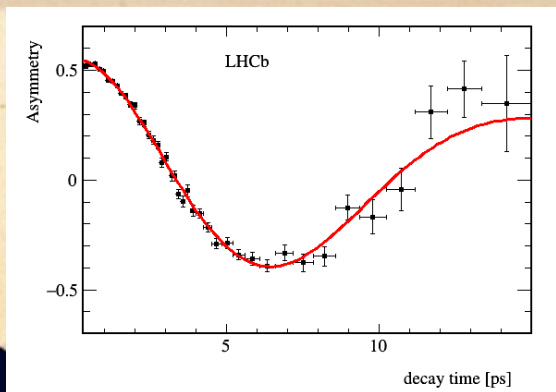
$$\pi^+ \pi^-$$



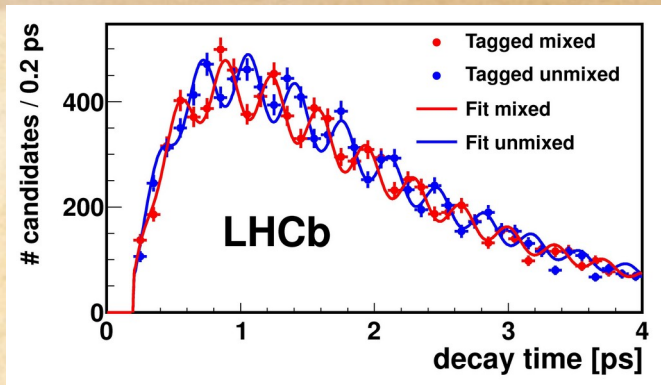
Oszillationen von B und D-Mesonen



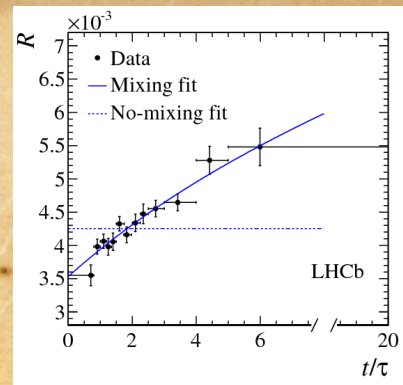
B^0 -Mesonen



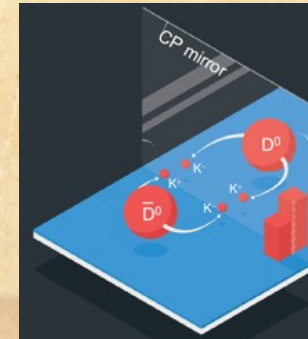
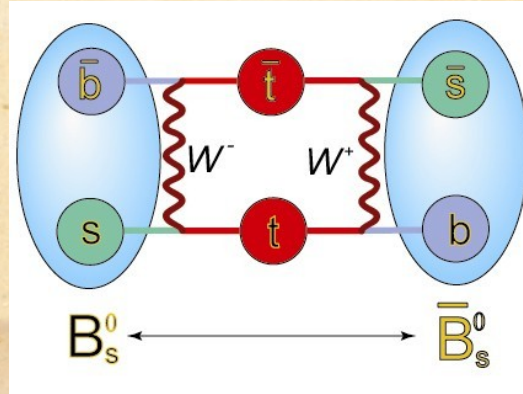
B_s^0 -Mesonen



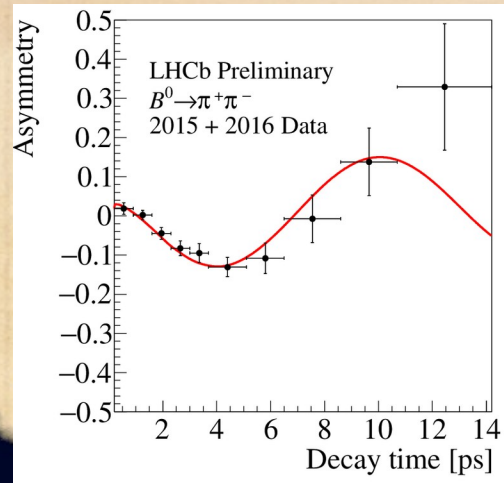
D^0 -Mesonen



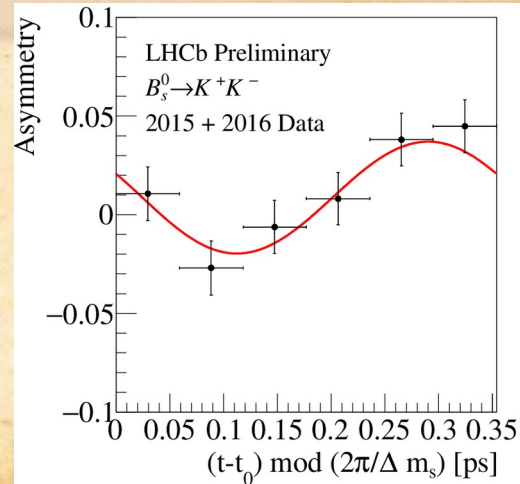
CP Verletzung in Zerfällen von B und D-Mesonen



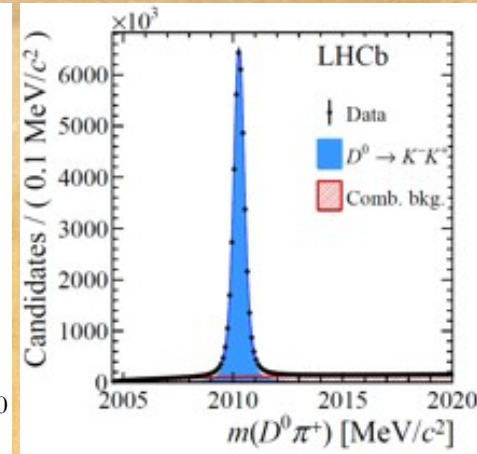
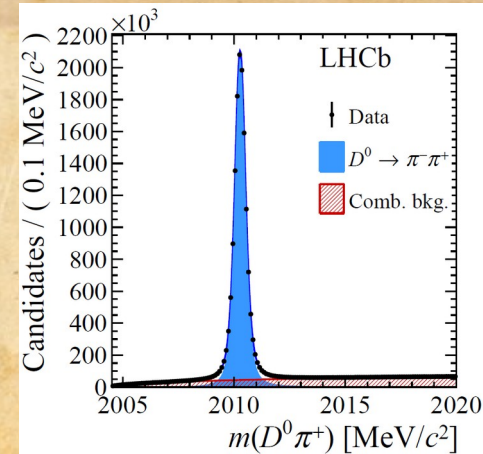
B^0 -Mesonen



B_s^0 -Mesonen



D^0 -Mesonen



CP violation and lifetime measurements in the decay $B_s^0 \rightarrow J/\psi \phi$ with the LHCb experiment

(Dissertation Simon Stemmler, Physikalisches Institut)

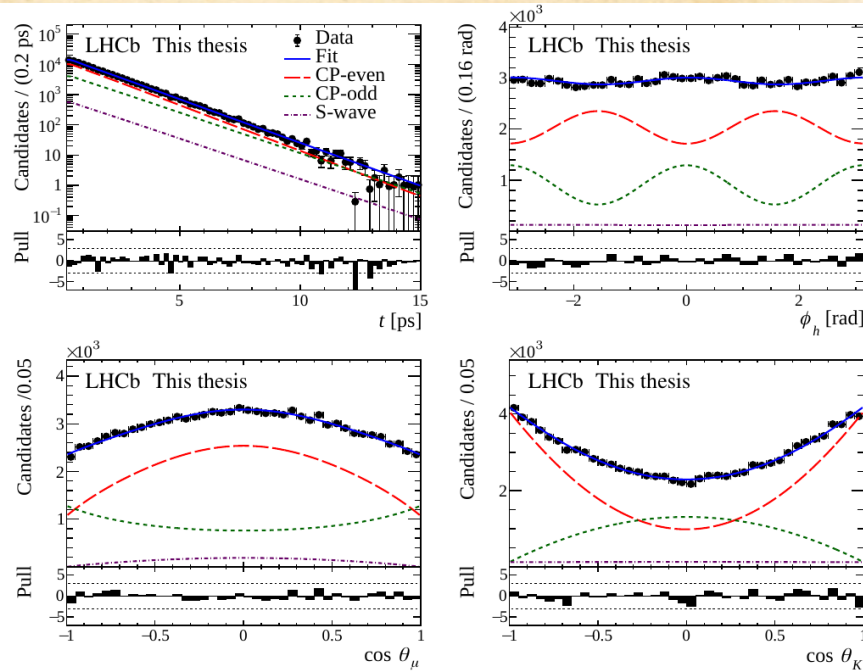
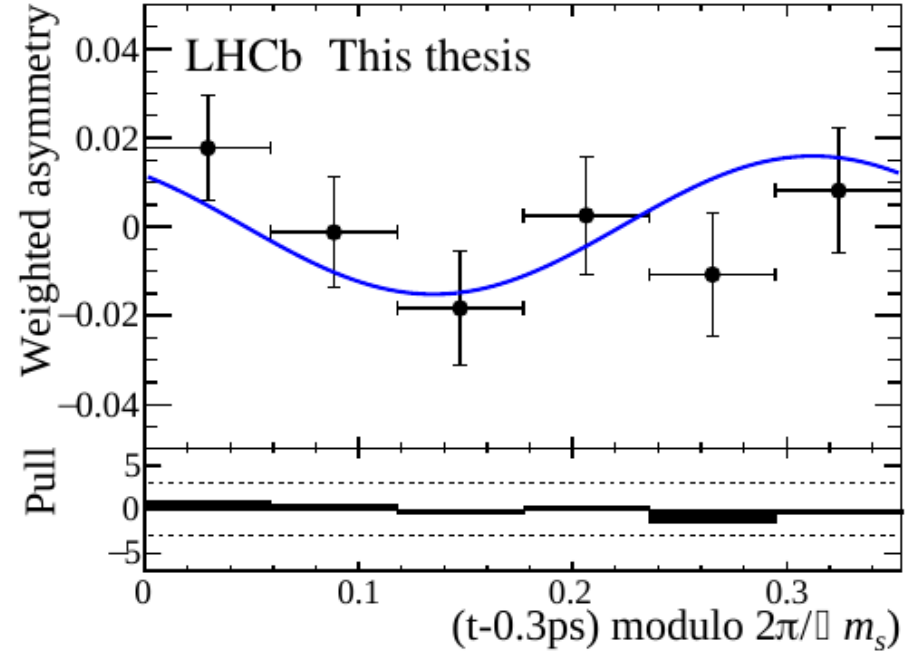
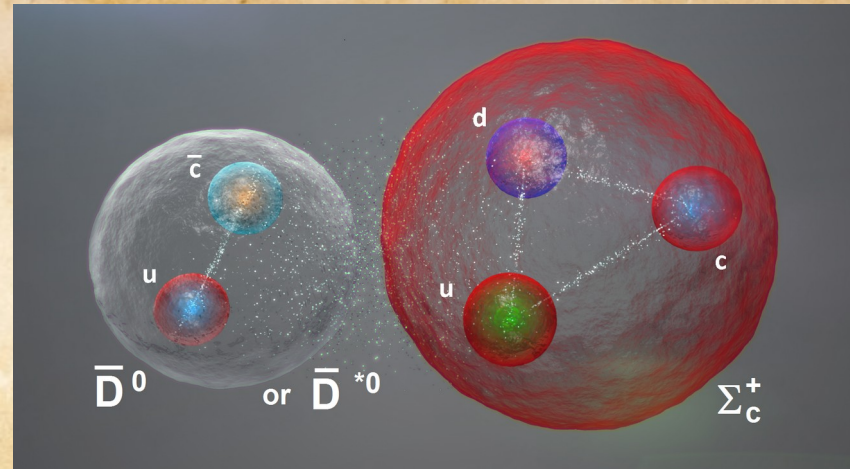
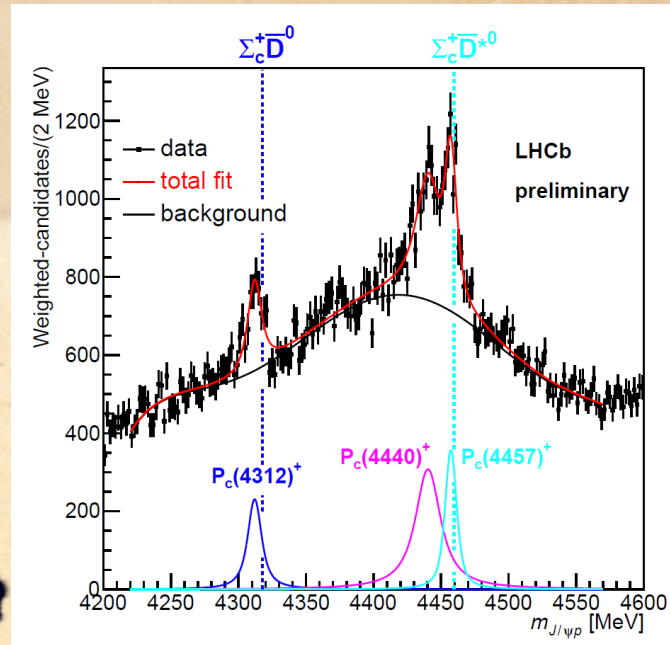
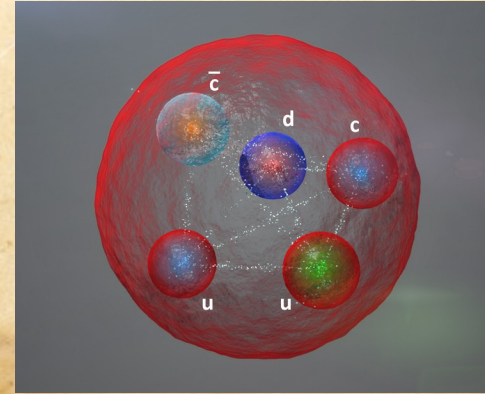


Figure 9.1: Projections of the decay-time and angular fit. Besides the background-subtracted data (black) and the overall fit projections (blue), also the CP-even (red), CP-odd (green) and the S-wave (purple) components are shown.



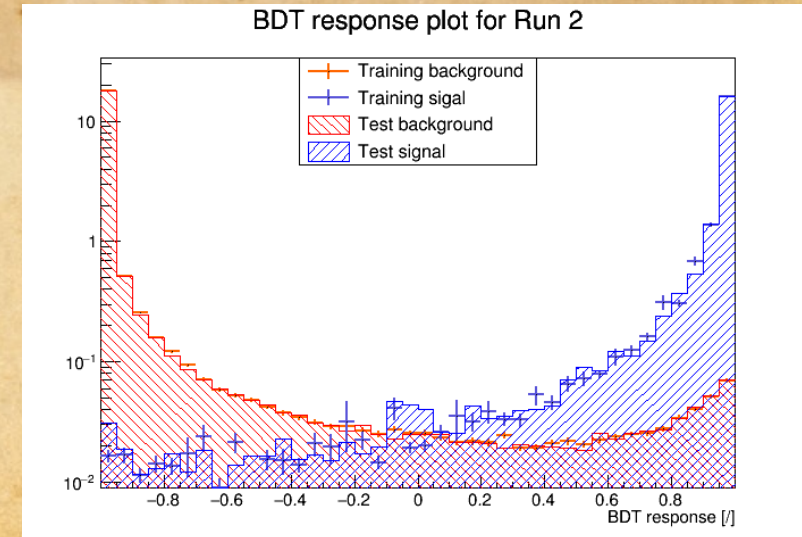
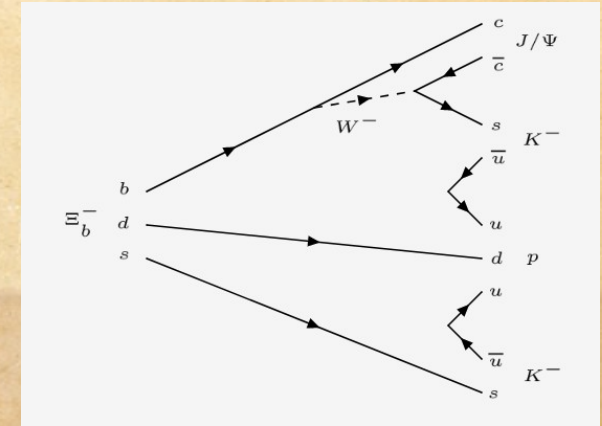
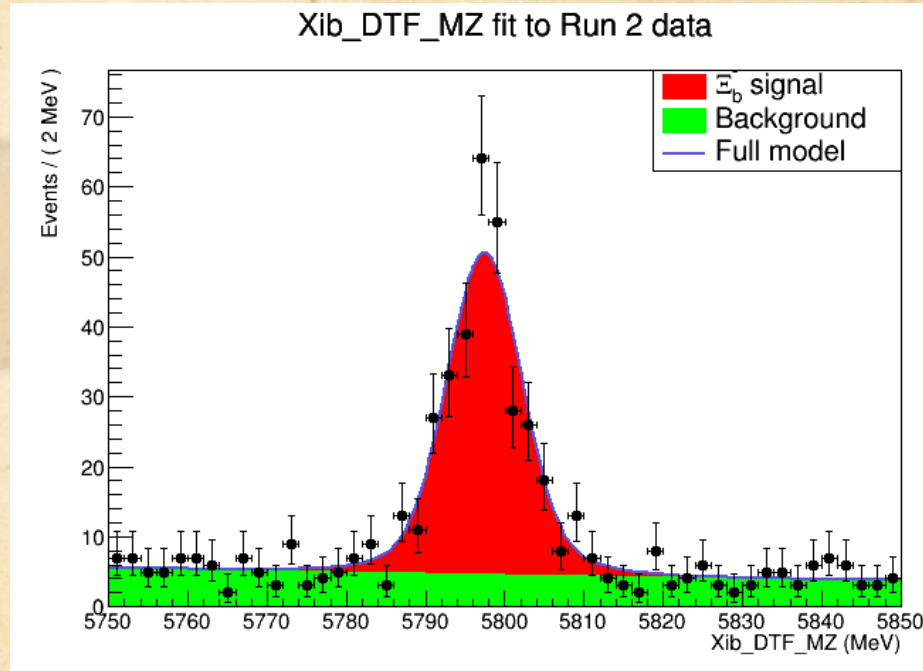
Hadronen mit 5 Quarks? Pentaquarks bei LHCb

Teilchen die aus mehr als 3 Quarks bestehen wurden bereits 1964 von Murray Gell-Man vorhergesagt. Sie wurden aber erst 2014 eindeutig von der LHCb Kollaboration nachgewiesen.

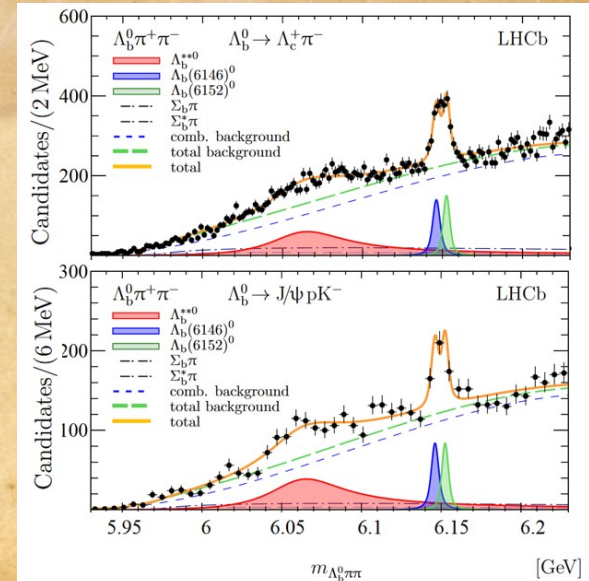
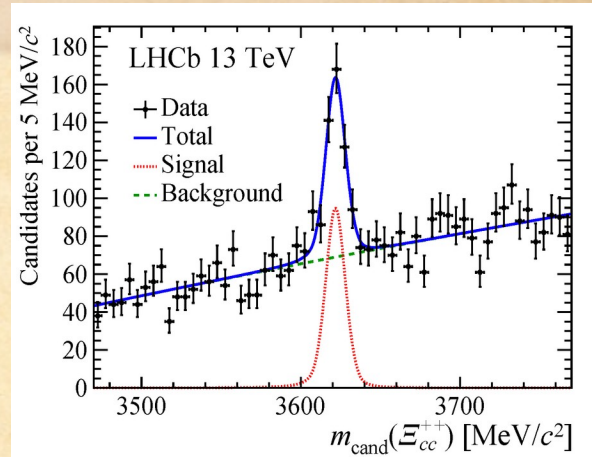
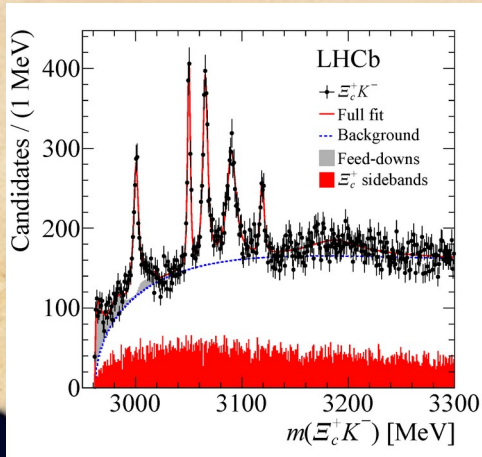
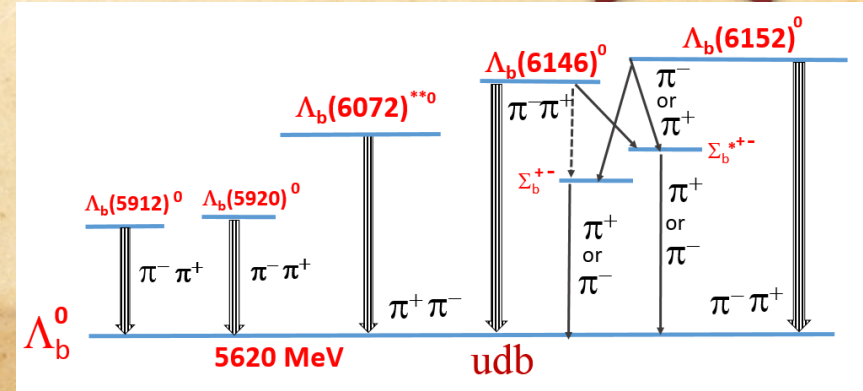
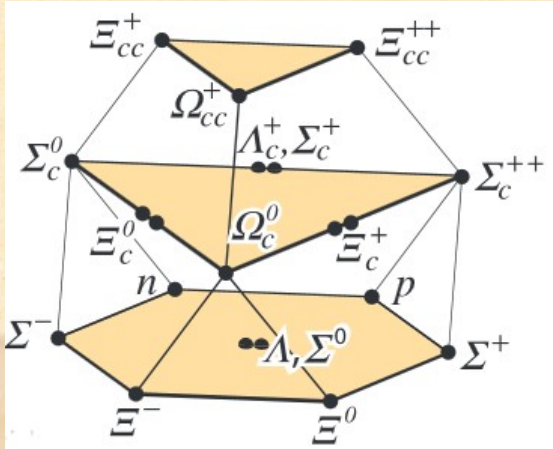


First observation of the decay $\Xi_b^- \rightarrow J/\Psi \bar{p} K^+ K^-$ at the LHCb experiment

Maurice Morgenthaler (Bachelorarbeit, 2019)

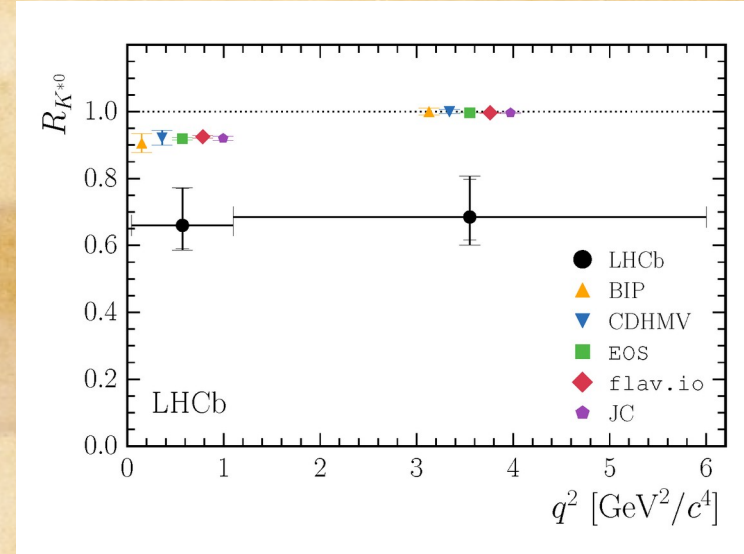
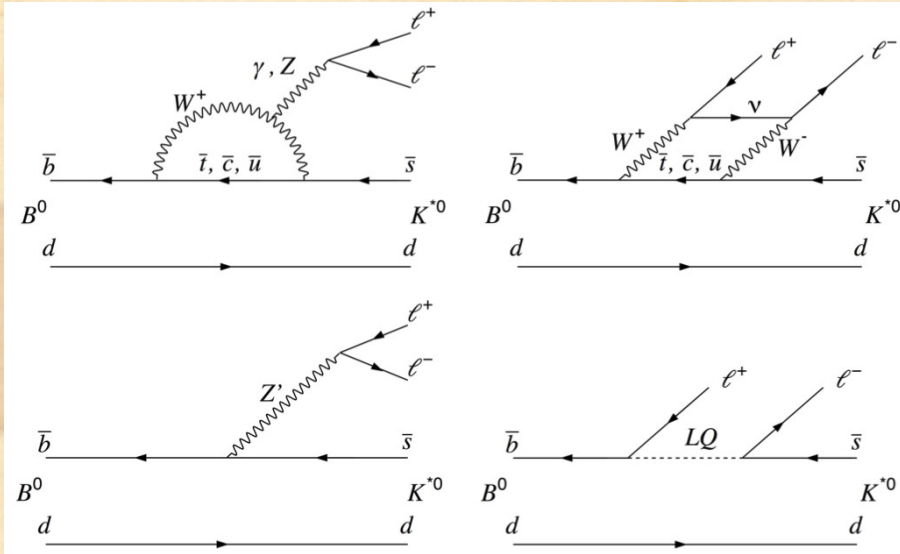


Neuzugänge im Teilchenzoo



Warum ist R_K nicht gleich 1?

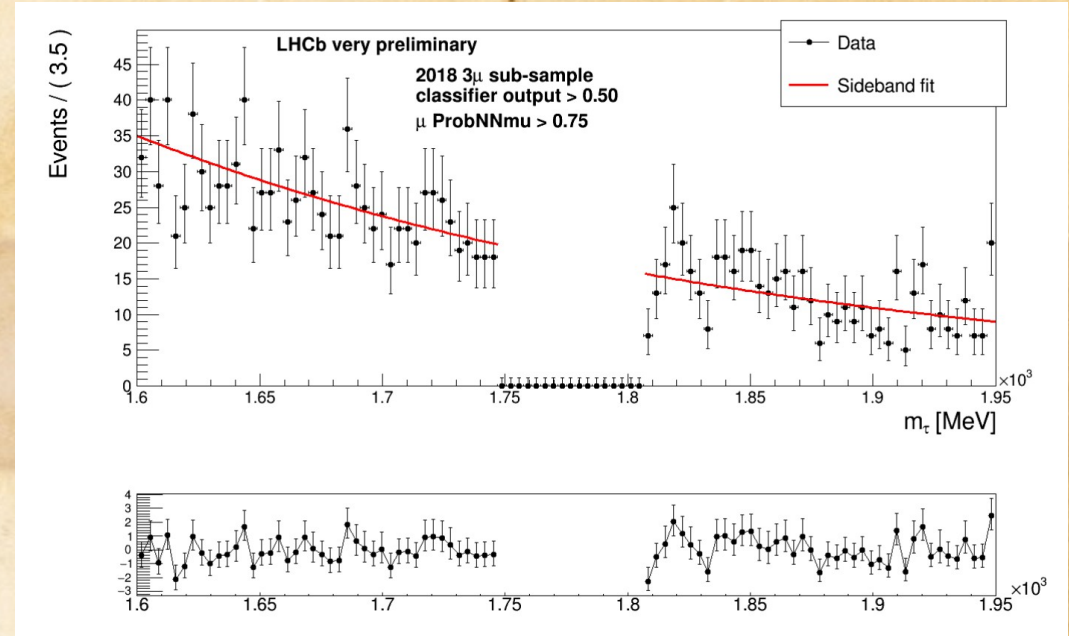
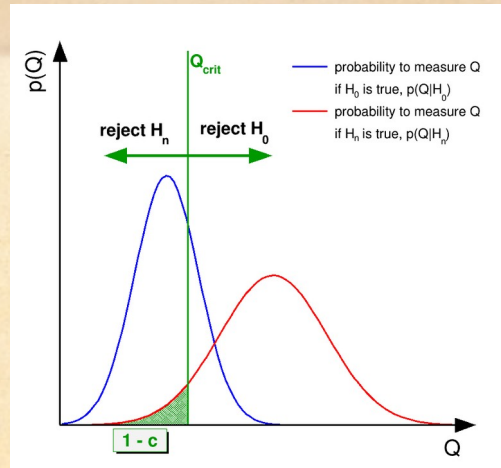
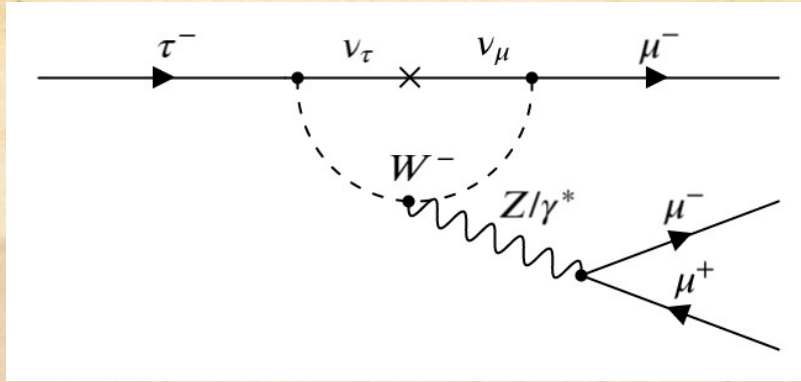
Erste Anzeichen für Leptonflavorzahl Verletzung???



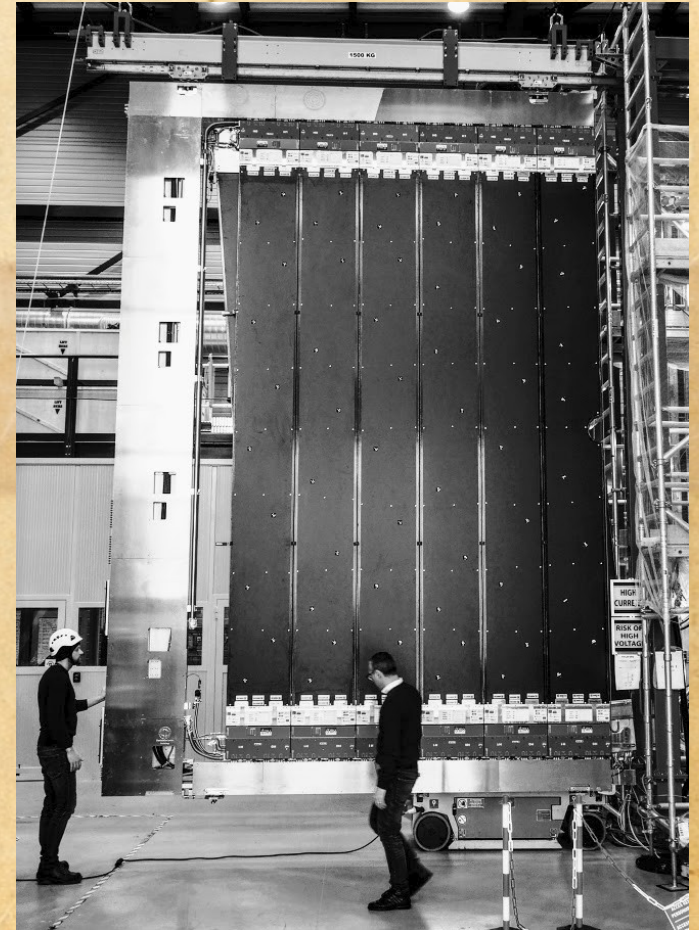
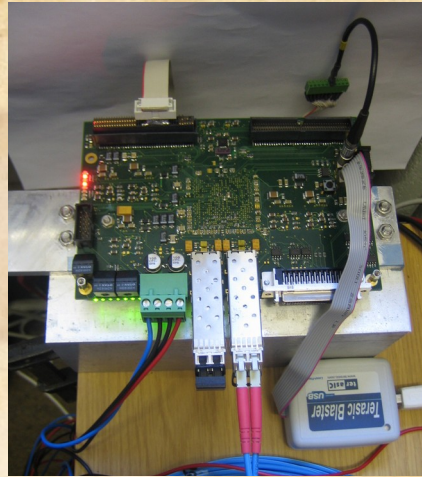
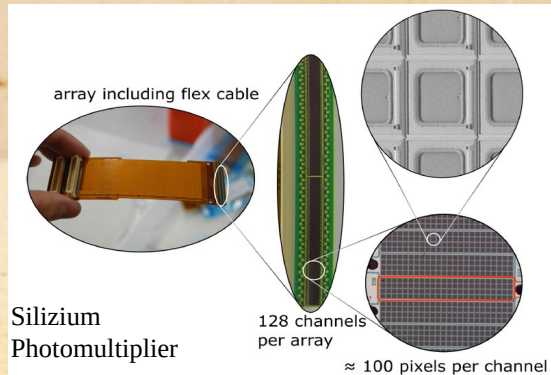
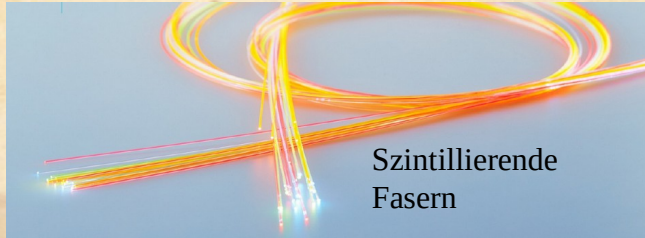
$$R_{K^{*0}} = \frac{\mathcal{B}(B^0 \rightarrow K^{*0} \mu^+ \mu^-)}{\mathcal{B}(B^0 \rightarrow K^{*0} J/\psi (\rightarrow \mu^+ \mu^-))} \bigg/ \frac{\mathcal{B}(B^0 \rightarrow K^{*0} e^+ e^-)}{\mathcal{B}(B^0 \rightarrow K^{*0} J/\psi (\rightarrow e^+ e^-))},$$

Search for the lepton flavour decay $\tau^- \rightarrow \mu^- \mu^+ \mu^-$

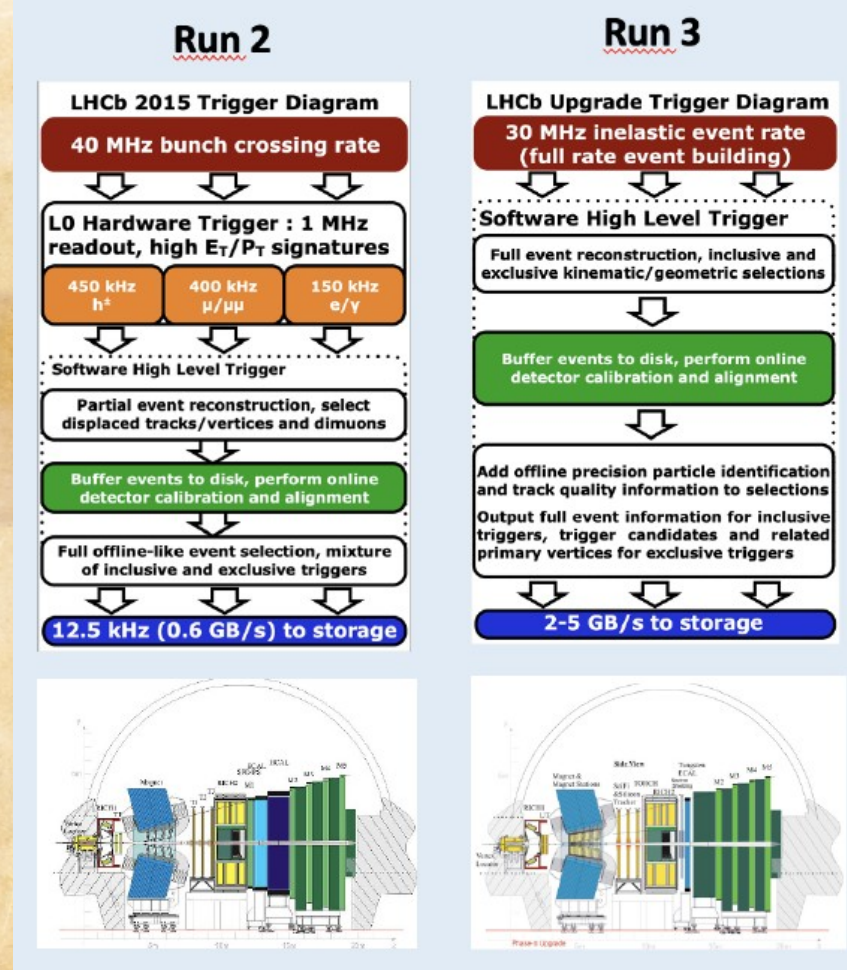
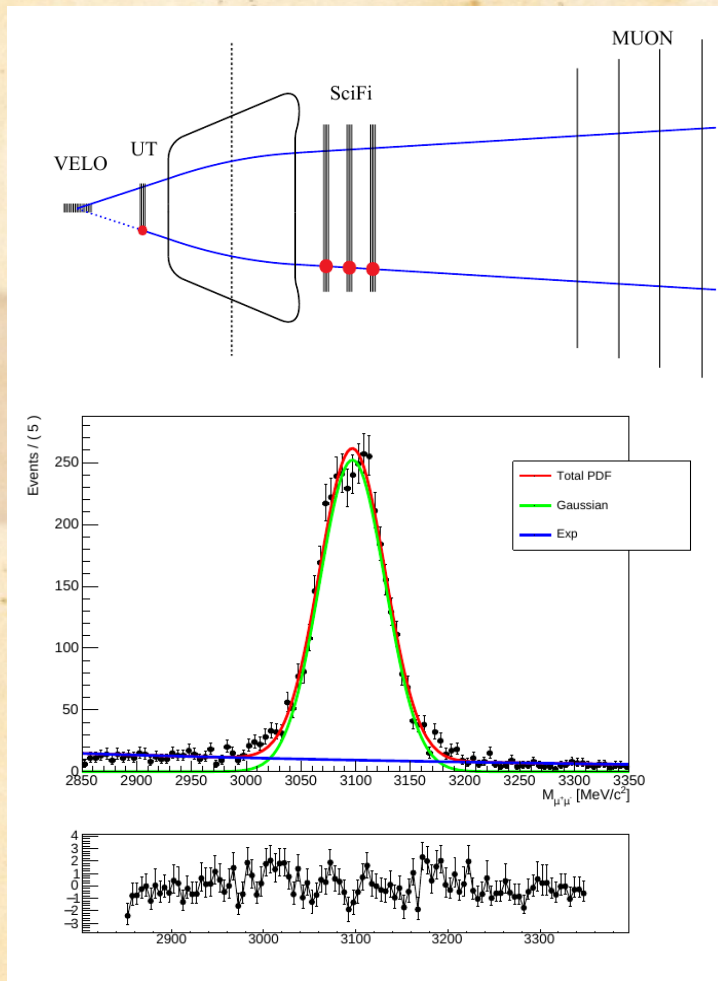
Rowina Caspary (Masterarbeit, 2020)



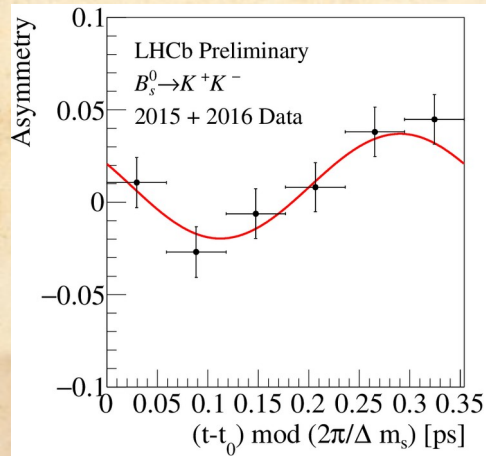
Von szintillierenden Fasern zum Spurdetektor: Detektorentwicklung in Heidelberg



Vom Detektorhit zum rekonstruierten Event: Entwicklung von Algorithmen zur Spurerkennung

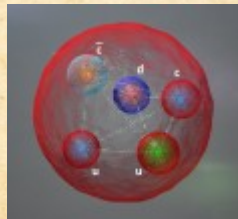
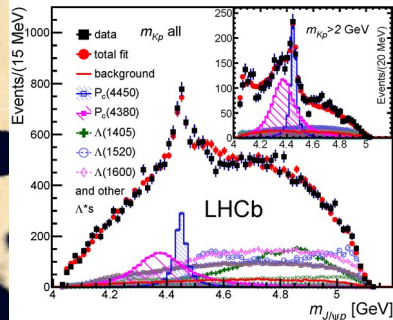


Die Heidelberger LHCb Gruppe am Physikalischen Institut



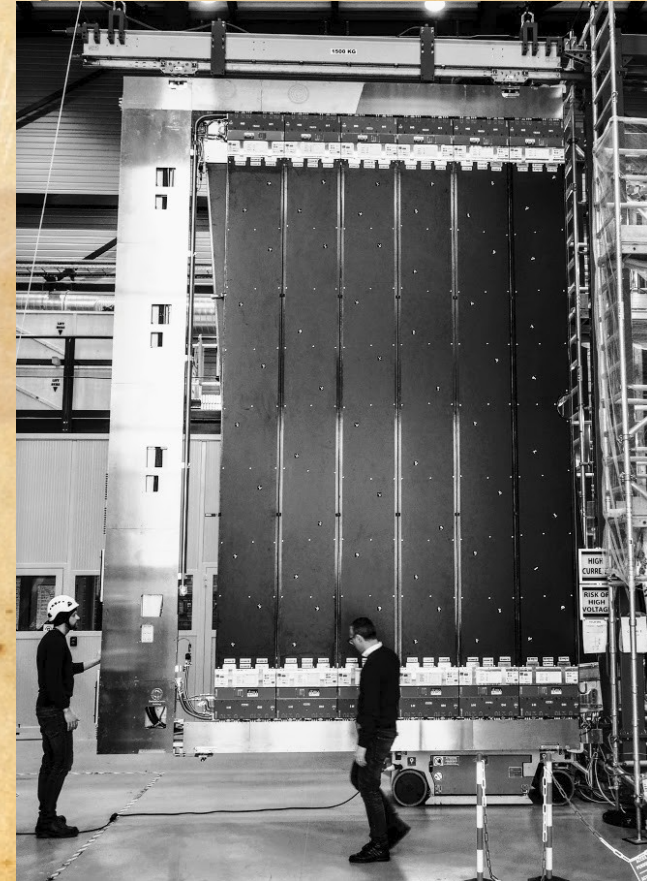
Der erste Nachweis von zeitabhängiger CP Verletzung in B_s^0 decays.

Die Heidelberger LHCb Gruppe



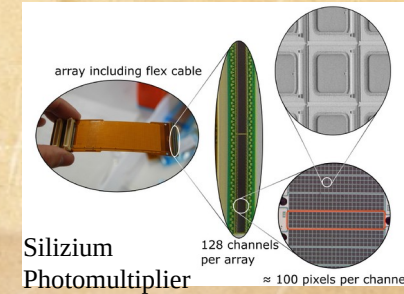
Artists View und experimenteller Nachweis von Pentaquarks

Bau eines Tracking Detektors mit szintillierenden Faser und Silizium Photomultipliern für das LHCb Experiment am CERN.



Anwendungen von szintillierenden Fasern und Silizium Photomultipliern in der Teilchenphysik und Medizin

Bau eines Tracking Detektors mit szintillierenden Faser und Silizium Photomultipliern für das LHCb Experiment am CERN.



Design für einen Strahlmonitor an der Heidelberger Ionenstrahl-Therapiezentrum (HIT)

