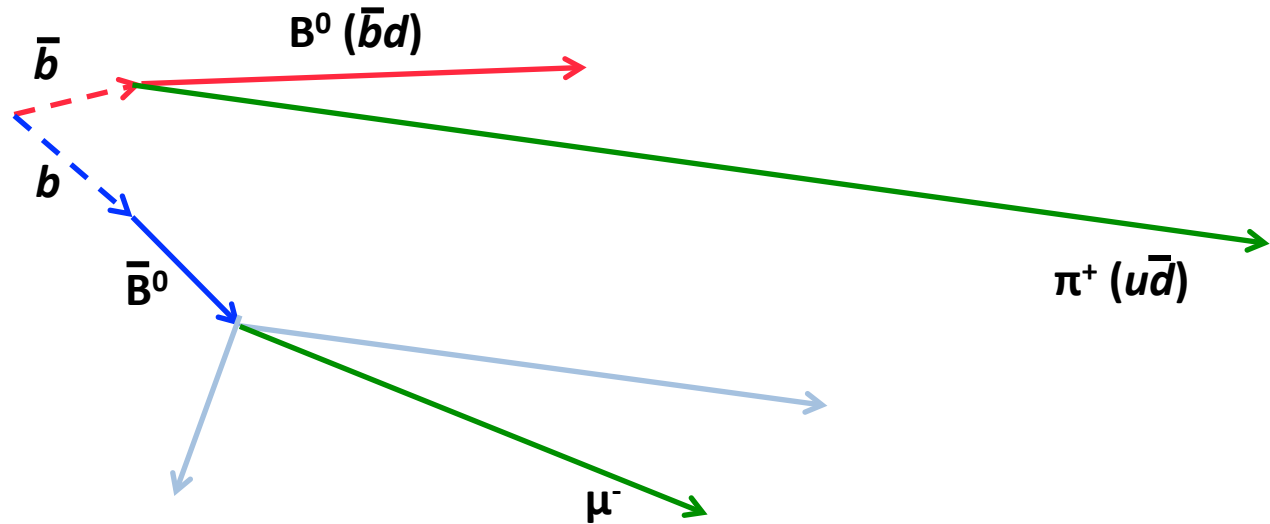# FlavourTagging in Run3

Any measurement of **a decay-time-dependent** quantities requires the determination of the **flavour of the B meson at production**.

Flavour-tagging: exploits the correlations between B flavour and other particles in the event.

FlavourTagging in Run3

Run 3:
- Huge amounts of data
- New software framework for both trigger and sprucing (formerly called stripping)

→ FlavourTagging will run in the sprucing and maybe later even in HLT2
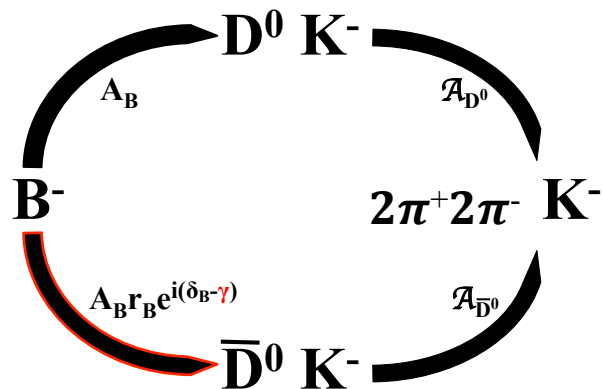→ FlavourTagging code needs to be made compatible with the new software framework

Gaudi::Functional framework requires:
- Multithread capable!
- All inputs and outputs clearly defined
- All tools and algorithms clearly defined
- More efficient code
- All new Moore configuration

CKM γ with $B^{\pm} \rightarrow D^0(\rightarrow 2\pi^+ 2\pi^-)K^{\pm}$

GGSZ method with $D^0 \rightarrow 2\pi^+ 2\pi^-$

D^0 K$^-$

A_B

$\mathcal{A}_{D^0}$

B$^-$

$2\pi^+ 2\pi^-$ K$^-$

$A_B r_B e^{i(\delta_B - \gamma)}$

$\mathcal{A}_{\overline{D}^0}$

$\overline{D}^0$ K$^-$

$$\Gamma(B^- \rightarrow DK^-, D \rightarrow f_i) \propto \bar{T}_i^f r_B^2 + T_i^f + 2\sqrt{T_i^f \bar{T}_i^f} (c_i^f \boxed{x_-} + s_i^f \boxed{y_-})$$

- $D^0 \rightarrow 2\pi^+ 2\pi^-$ has 5 dimensional phase space
- Divide the phase space into bins
- Each bin provides a separate measurement of γ