

## Installation of the workshop: objectives, agenda, timeline

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- 0) Installation (this one)
- 1) Electroweak penguin transitions  $B^0 \rightarrow K^{*0} \tau^+ \tau^-$  (S.Monteil)
- 2) Search for cLepton-Flavour-violating  $Z$  decays (M.Dam)
- 3)  $CP$  violation in  $B$  mesons mixing (D. Arogancia)
- 4) BSM in  $\Delta F = 2$  quark transitions (V. Tisserand)
- 5) Status and prospects from Krakow (M. Chrzascz)

- This is aligned with the table of contents of the Flavour chapter of the CDR book FCC-ee Physics and Experiments.

- 1 Installation of a Flavour Physics case at FCC-ee
- 2 The anticipated landscape after LHCb upgrade and Belle II experiments
- 3 Rare decays and lepton universality violation
  - 3.1  $b \rightarrow s\ell^+\ell^-$  phenomenology
  - 3.2 Experimental sensitivity for  $B^0 \rightarrow K^*(892)\tau^+\tau^-$
  - 3.3 Search for  $B^0 \rightarrow \tau^+\tau^-$
- 4 Lepton Flavour violation in  $Z$  decays
- 5  $CP$  violation in the quark sector
  - 5.1 The  $\gamma$  angle measurement with  $B_s \rightarrow D_s^\pm K^\mp$
  - 5.2 Search for  $CP$  violation in neutral  $B$  meson mixings
  - 5.3 Perspectives for the CKM global fit
  - 5.4 Perspectives for the search for BSM Physics in  $\Delta F = 2$  transitions CKM global fit
- 6 Additional studies: LFV in  $\tau$  decays,  $c$ - and  $b$ -hadron spectroscopy, exclusive decays of the  $Z$  boson
- 7 Requirements for the detector design and performance

# Objectives of the meeting



- The meeting is meant to
  - Review what has been done so in the experimental studies,
  - Discuss what left to be done (we should come up with a list and a timeline),
  - Explore other Flavour opportunities at large phenomenology-wise (tomorrow)
  - Coordinate the documentation of the studies when needed.
- The timeline
  - The studies (pheno. and exp.) must be documented asap.
  - The FCC week in Amsterdam is the target to have the complete document.
  - The CDR is to be due (published) at the end of 2018. It will thoroughly reviewed by then.

# Objectives of the meeting



What is not covered in this first half-days meeting are the two important following sections

- $B_s \rightarrow \tau^+\tau^-$
- The need of a hadron PID detector.

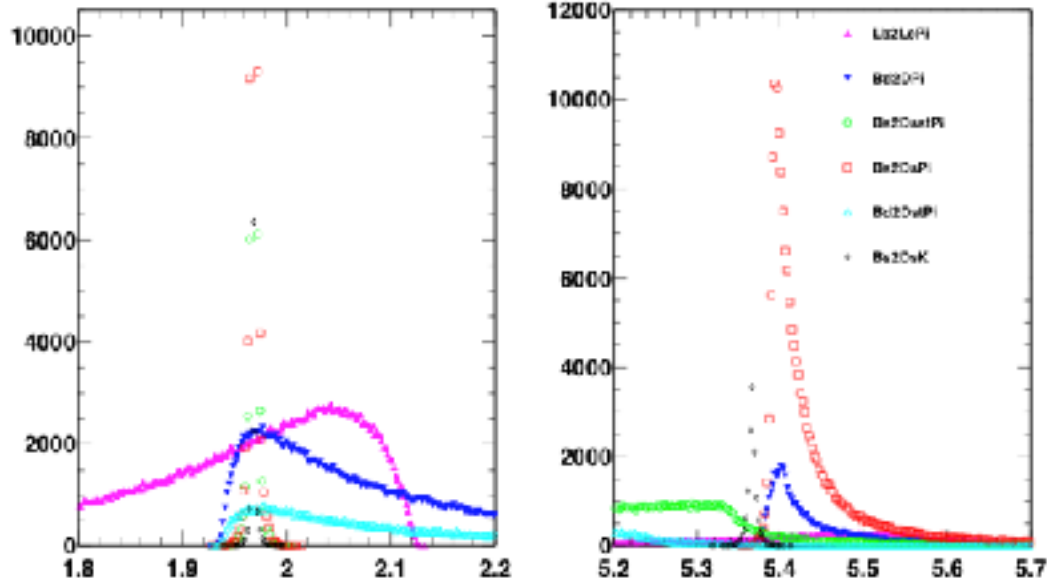
Let's spend one slide on each subject.

- Physics motivation for  $B_s \rightarrow \tau^+\tau^-$ : helicity suppressed dileptonic decay dressing a variety of BSM scenarii.
- The SM branching fraction is  $O(10^{-7})$ . The current experimental limit (LHCb) is modest  $< 6 \cdot 10^{-2}$ .
- Very challenging experimentally. Two missing neutrinos but no secondary vertex... Partial reconstruction in order but how to infer the secondary vertex.
- FCC-*ee* is unique:
  - Direction of the opposite hemisphere  $b$  quark.
  - Measurement of the missing energy momentum in the decay hemisphere.
  - Signal tuples w/ parametric detector resolutions available.
  - Marseille (CPT+CPPM) groups are investigating.

# Aparté: what is not covered today



- Do we need hadron PID ? Proxy Bs2DsK. © Vava Gligorov.



- Yes ! Up to 10 GeV.
- The TORCH technology has been explored (R. Forty). It seems that the momentum coverage for a good separation won't exceed 5 GeV.
- Instead, the  $dE/dx$  of the IDEA wire chamber would make the job.

# Time schedule



- Let's start !

Wed 31/01

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14:00	Installation / objectives of the two half-days meeting 2-R-030, CERN	Jarney F. Kamenik et al 14:00 - 14:15
	Search for $B^0 \to K^{*0}(\rho^0) (\tau^+ \tau^-)$ 2-R-030, CERN	Stephane Monteil 14:15 - 14:40
	Lepton Flavour-Violating $B^0$ decays 2-R-030, CERN	Mogens Dam 14:40 - 15:05
15:00	SCPS violation in $B^0$ -meson mixings 2-R-030, CERN	Mr. Dennis Arigandis 15:05 - 15:30
	Coffee Break 2-R-030, CERN	15:30 - 16:00
16:00	New Physics in $B^0 \to F = 2^+$ quark transitions 2-R-030, CERN	Vincent Tisserand 16:00 - 16:25
	Status and plans for the Krakow group 2-R-030, CERN	Marcin Chruslacz 16:25 - 16:50