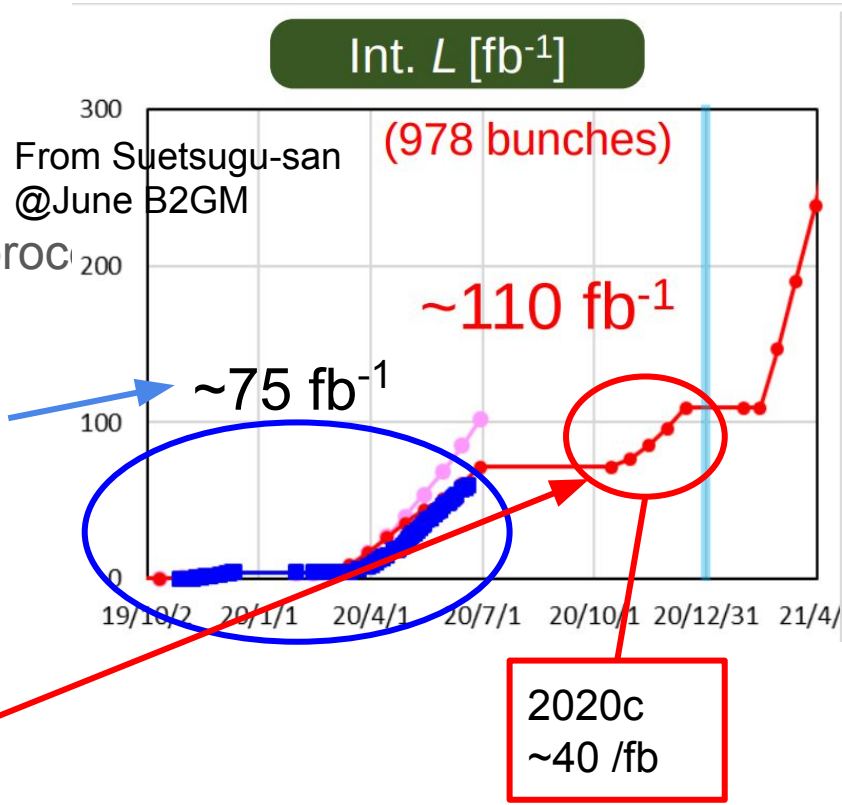
News and plan

TDCPV meeting
24/8/2020

Stefano Lacaprara, Yusa-san
INFN Padova, Niigata Univerity

Lumi and DP plan

- For ICHEP ~35 /fb
- Other ~30 /fb already collected and being proc
  - Bucket13 ~5/fb **DONE**
  - Bucket14 ~10/fb **DONE** @kekcc
    - Running on grid
  - Bucket15 ~20/fb calibration in progress
- Total ~75/fb (including 10% off-res)



- Additional ~40 /fb foreseen for 2020c

- **Total ~110 /fb**

Tentative DP plan for Moriond 2021

To be discussed at DP Workshop 8-11 Sept

- Tentative plan for Data processing
  - Finish prompt processing exp12 with release 4
    - No reprocessing of exp12
      - No major update in calibration expected, so stick with prompt.
  - **Prompt processing of 2020c data with release 5**
  - Reprocessing of 2019/2020 data (proc12) w/ release 5 later
    - Unlikely to be available for Moriond
- Tentative plan for MC production
  - MC14 will start on ~Oct w/ release 5
    - Run dependent (tbd /ab) and run independent (~1/ab)
- For Moriond timescale, we will likely work on data and MC we already (almost) have and w/ release4
  - To be confirmed!

Analysis SKIM (udst)

- For MC14 we expect to use only udst
  - Mdst only for limited/special use cases
- For Data (proc12) udst will be produced
  - but access to mdst will be possible but not encouraged
- Each analysis need to validate udst for its signal
  - We already know that we need to fix something
  - We need to have it fixed before udst production for MC start
    - Do not aim for perfection, this will be an iterative process
  - Do we need additional skims?
    - Eg dileptonic one (by Ale)
    - Low multiplicity channels (eg B->pi0pi0) being discussed in charmless WG
    - Need coordination with other WG (mostly charmless for us)
- More discussion on Data Production workshop 8-12 sept
  - Thursday 10th dedicated to skimming

To be discussed at DP Workshop 8-11 Sept

From phys coordinator

- Will collect all results for ICHEP LINK into a public page, to be advertised
  - Author need to contribute to description of analysis motivations/techniques/results, and send some text to Ale, Tom Browder, and Todd Pedlar.
- Schedule for future publication similar to that for ICHEP
  - "Just in time" should be an exception
    - Ok-ish for conferences, not in general
  - A good analysis need a good review
    - So need time for reviewers
  - Documentation has to be in good shape already when RC starts
    - This was a weak point for J/psi Ks rush for ICHEP

	Recommended	"Just in time"
Start of WG review	June 1st	June 15th
Start of RC review	June 20th	July 3rd
Start of CWR	July 10th	July 20th

- Data taking so far (mostly) with HLT in monitoring mode: will switch to HLT-filtering mode in 2021, and start partially on 2020c run
  - Should not affect our WG, but it would be nice to verify this
    - Run on some selection for our channel on all events and check the impact of HLT filter
    - Might be important for low multiplicity final states (eg B->pi0 pi0)

Plan for WG publication/papers

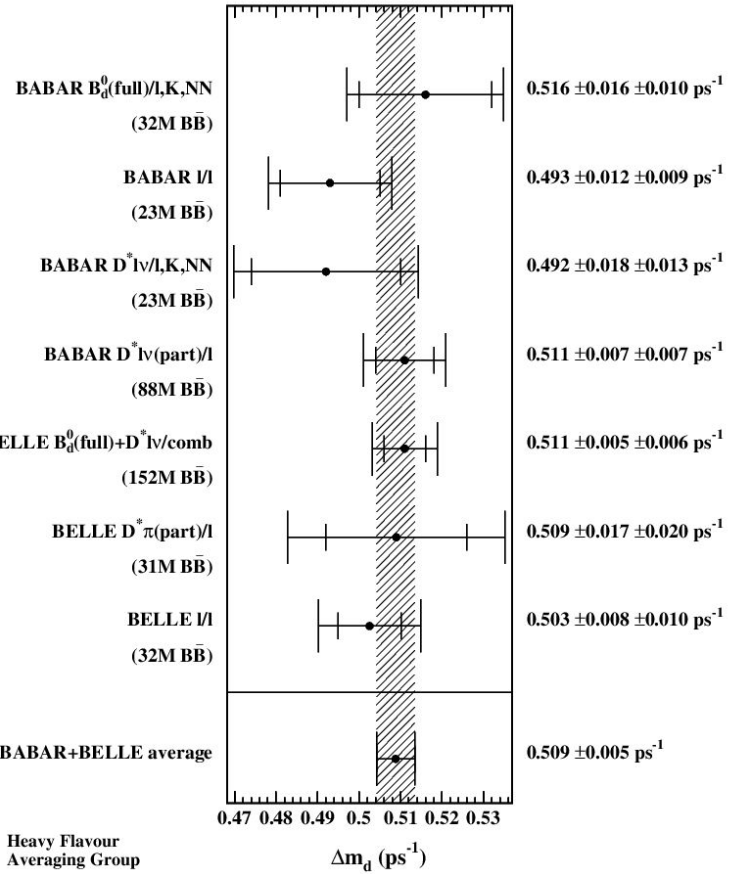
- Phys coordinator strongly encourage full conference paper wrt approved plot
- Plan up to winter conferences, using ~70 /fb dataset
- Candidates:
  - B0 -> Eta' Ks
  - B0 -> J/psi KL
  - J/psi Ks with MC reweight approach ?
    - Some remarks already raised in past WG meeting
  - Other analysis?

- Plan for J/psi Ks - standard method (next slides)

J/psi Ks

- Approved plot and first measurement of Δm_d and CP parameter
- Next step (as suggested by Ale @juneB2GM) could be:
  - **B lifetime and mixing frequency**
  - Also tau(B+)
  - **target is a journal paper**
- Double goals:
  - **Have a publishable result**
    - Need to assess all systematics, again, a good exercise toward CPV parameters measurements.
  - **Validate all analysis tools,**
    - To achieve the measurement we will need to cover all key elements which are needed for a full TDCPV measurement, which will follow later.

Δm_d and τ_B status @B-factories



Ale @juneB2GM

Experiment	Lumi.	$\tau(B^0)$	Δm	Technique
BaBar	21 fb^{-1}	1.523 ± 0.024 ± 0.022	0.492 ± 0.018 ± 0.013	Reco. semileptonic
BaBar	21 fb^{-1}	1.546 ± 0.032 ± 0.022		Hadronic
Belle	29 fb^{-1}		0.503 ± 0.008 ± 0.010	Inclusive dileptons
BaBar	81 fb^{-1}	1.504 ± 0.013 ± 0.015	0.511 ± 0.007 ± 0.007	PR semileptonic
Belle	140 fb^{-1}	1.534 ± 0.008 ± 0.010	0.511 ± 0.005 ± 0.006	Hadronic
LHCb	1.0 fb^{-1}	1.524 ± 0.006 ± 0.004		B → J/ψ K^{*0}
LHCb	3.0 fb^{-1}		0.5050 ± 0.0021 ± 0.0010	Reco. semileptonic

- L used is comparable with Belle II one
- Measurements are systematics limited
- Different technique have been used

Sharing the work

- We have two strong groups in WG:
  - Need to ensure cooperation for common items but also encourage both groups to reach publishable results
- Proposed solution:
  - **EU groups focus on Δm_d and w measurement using the hadronic channels using analytical resolution approach**
  - **Japan group focus Δm_d on semileptonic (and J/psi Ks) using belle-style resolution function**
    - **Dileptonic can be done also**
- Thibaud and Chiara to lead/coordinate the two groups as was for ICHEP
  - Need to report regularly at the WG meeting
    - Both for individual tasks and for the analysis as a whole

Longer term plan

- Resolution function should be interchangeable (“plug-in”) so each analysis can use the one from the other group
  - This will allow a fair comparison of the full performances of both approach
  - Possible to choose which one would be the main method and which one the cross-check one
  - Or (even better) understand the pros and weakness of either and try to merge the two methods.
- This will provide a lot of lesson and expertise in view of **$\sin(2\phi_1)$** once the Belle II dataset will be comparable/larger than Belle.
  - Measurement of Δm_d with both resolution functions will allow to develop both methods at the same time.

Tentative task lists

All tasks sharing and people need to be discussed and agreed upon, people listed here are those who contributed to the items so far (and we might have missed someone, sorry)

- CP side:
  - J/psiKs selection re-tuning/inputs for CP fit
    - Simple selection vs BDT
  - Scaling of vertex error to improve pull width to be unit (Higuchi)
  - Tag side: investigate usage of tree fitter (Lukas)
  - CP-side resolution model validation (Japan group)
- Tag side
  - TagV MC/data difference when applying IP constraints (Radek)
  - Flavor tagger inputs MC/data difference (Fernando, Colm)
  - Δw for larger statistics (Fernando, Colm)
- Control samples
  - Semi-leptonic control samples (Thomas, Bae, Sumisawa, Hara)
  - Hadronic control samples (Thibaud, Jakub)

Tasks (cont'd)

- Background studies
  - Peaking, MC truth matching
- Resolution function
  - Ok to continue with two approaches (analytical [EU] vs Belle style [J])
  - need to be sure that the actual function is shared and both can be plug in the fitter core to compare them with a complete analysis.
  - Outcome of full analysis will help to decide a long term solution
- Other charmonium states ($\psi(2s)$,η_C,χ_C)
- Fitter
  - Fit procedure/Fitter common code (Chiara, Thibaud):
    - to be merged into a single code (and on stash)
  - Plug in of resolution functions
  - Binned-w for CP fit (Chiara)

Data Production liason

- **Sviat Bilokin** wishes to step down as Data Production liason
  - **Many thanks for all the work done!**
- Data Production Liaisons responsibilities: https://confluence.desy.de/display/BI/Data+Production+Liaisons
  - Be aware and report MC and DP status and plan to WG
    - Follow be-weekly DP meeting
  - Collect MC generation request and submit to MC prod repository
    - Well documented
    - Follow and check production
  - Validation of new release for WG
- A good opportunity to get more involved in WG as well as MC and Data production
- Anyone interested?
  - Get in touch with Conveeners for more information

Today meeting

Backup

Data Production status

- **bucket13 (2020a/b data - runs 4272-4481, ~5.0/fb)**: details on **Processing 2020a-b**
  - HLT skims on KEKCC, all events on the grid
    - Also mdst for hlt_hadron available on the grid
      - And udst - systematics skim
- **bucket14 (2020a/b data - runs 4686-5247, ~9.7/fb)**: details on **Processing 2020a-b**
  - HLT skims on KEKCC
    - hlt_hadron + all events on the grid (in progress)
- **bucket15 (2020a/b data - runs 5248-6427, ~19.0/fb):** details on **Processing 2020a-b**
  - Cdst production for post-tracking calibration in progress
- Slow down due to kekcc/distributed computing servers replacement