

Search for the rare decays $B \rightarrow K\nu\bar{\nu}$ at Belle II

Group Meeting - B2Knunu

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29 November 2024

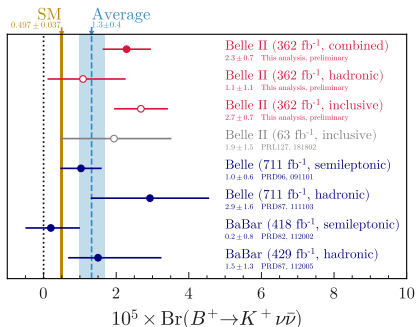


1 November 29, 2024

State of the art

State of the art:

- Analyses carried at Belle II for Hadronic Tagged Analysis (HTA), Inclusive Tagged Analysis (ITA) and combined
- Decay channel: $B^+ \rightarrow K^+ \nu \bar{\nu}$
- Results:



Main goal

- Carry the same analysis for the Semileptonic Tagged Analysis (STA)
- Compare the results between the three analyses for completion with respect to the previous analyses (BaBar and Belle)
- Will do for the decay channel $B^+ \rightarrow K^+ \nu \bar{\nu}$
- May also do it for $B^* \rightarrow K^* \nu \bar{\nu}$ (need to be done anyway by someone)

First approach

- Very similar to HTA since exclusive analysis
 - Will use *semileptonic* FEI instead of hadronic
 - Variable of interest for HTA: q^2
- Variable of interest for STA: q^2 and θ_{BY}

Quests

Mainb quests:

1. Take the previous workflow, understand it and automatize it using B2LUIGI (95% done)
2. Adapt the workflow to the STA (partly done by Jacopo)
3. Change the PID corrections to run dependent

Side quests:

1. Switch the plots from homemade functions (.png, burk) to PLOTHIST (.pdf, wow)
2. Change computation of uncertainties to **more standardized way** → may use **SYSVAR** if available
3. Use **CABINETRY** for management of PYHF fits
4. Check for usage of **PYHFCORR** for correlation in PYHF fits