$B \to K^{(*)}\nu\bar{\nu}$ decays: status and future prospects

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on behalf of Belle and Belle II collaborations

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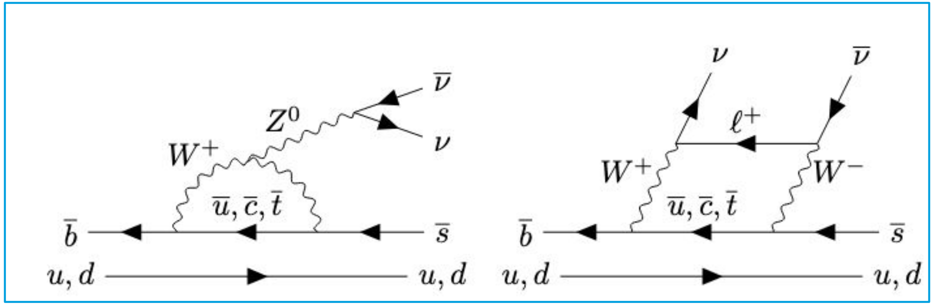
Physics in SM (exclusive)

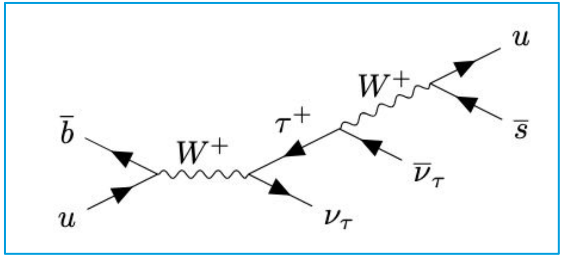
Occurs through flavor-changing neutral current:

- **Rare**: b $\rightarrow s\nu\bar{\nu}$ transition suppressed by the GIM mechanism
- **Precise SM predictions**: small hadronic uncertainties, dominated by form factors

Short-distance contribution



Long-distance contribution



@SM predictions: EPJC 83 (2023) 252

Decay	SM short-distance prediction, 10^{-6}
$B^+ \rightarrow K^+\nu\bar{\nu}$	$4.32 \pm 0.16 \pm 0.26$
$B^0 \rightarrow K^0_S\nu\bar{\nu}$	$2.00 \pm 0.07 \pm 0.12$
$B^+ \rightarrow K^{*+}\nu\bar{\nu}$	$9.35 \pm 0.94 \pm 0.56$
$B^0 \rightarrow K^{*0}\nu\bar{\nu}$	$8.65 \pm 0.87 \pm 0.57$

↓ FF ↓ CKM+higher order corrections

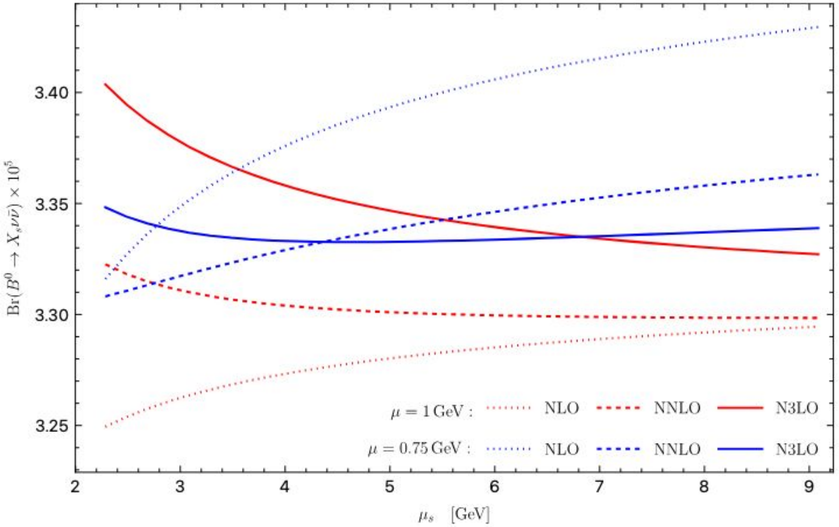
Physics in SM (inclusive)

Inclusive $B \to X_s \nu\bar{\nu}$ prediction using Heavy-Quark Expansion [Fael et al., arXiv:2512.19138]

- Needed N3LO to be stable vs renormalization scale variation
- Results:

  $Br(B^0 \to X_s \nu\bar{\nu}) = (3.351 \pm 0.102) \times 10^{-5}$

  $Br(B^+ \to X_s \nu\bar{\nu}) = (3.618 \pm 0.110) \times 10^{-5}$

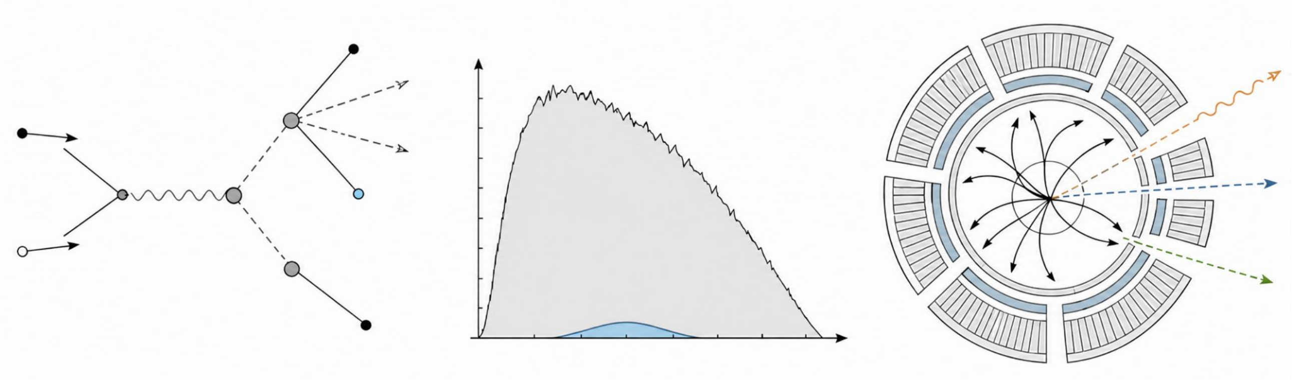


Uncertainty breakdown:

$Br(B^0 \to X_s \nu\bar{\nu}) \times 10^5 = 3.351 \pm 0.058_{Vcb} \pm 0.029_{param} \pm 0.043_{HQE} \pm 0.065_{scale}$

- Main uncertainty should be $|V_{cb}|$ taken into account exclusive/inclusive discrepancy
- Still very precise, 10% uncertainty in total including difference between exclusive and inclusive $|V_{cb}|$

Challenges



Two undetected neutrinos

Only $K^{(*)}$ is reconstructed, leaving the signal kinematics underconstrained

No narrow signal peak

$O(10^{-5}–10^{-6})$ signals sit beneath abundant B-decay and continuum backgrounds

Fake missing energy

Undetected K^0_L, neutrons, photons and acceptance losses can imitate $\nu\bar{\nu}$

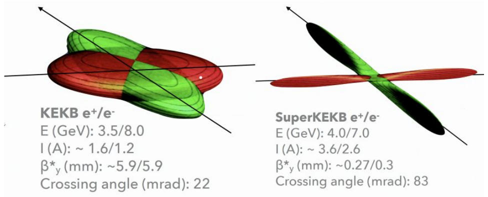
Sensitivity depends on reconstruction efficiency, background control and detector hermiticity

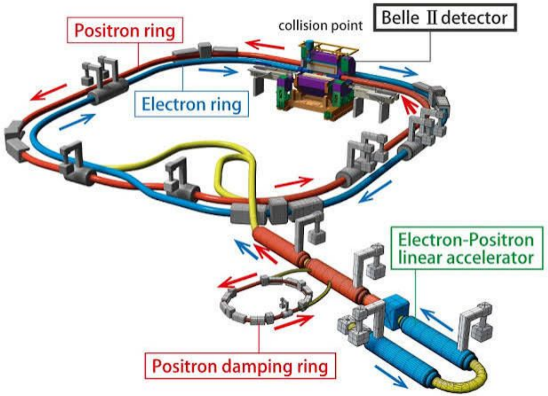
Belle II @SuperKEKB

Luminosity frontier e^+e^- collider operating at or near Υ(4S)

$$e^+e^- \to \Upsilon(4S) \sim 1.1 \text{ nb}$$

$$\Upsilon(4S) \to B\bar{B} \quad > 96\,\%$$

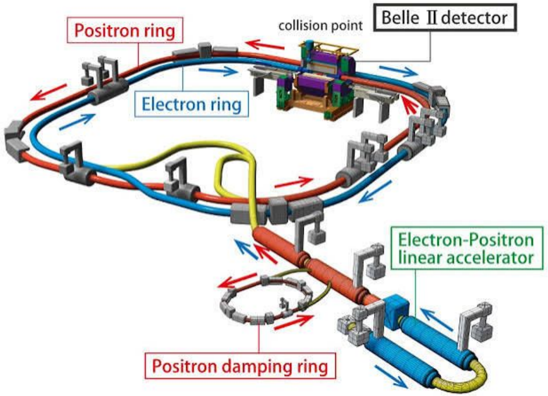




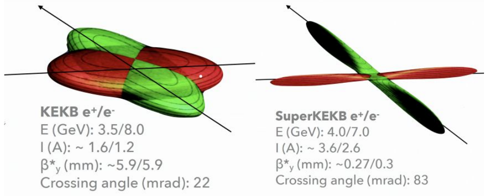
- Belle (1999–2010) collected 1040 fb^{-1}
- Belle II at SuperKEKB (2019–present)
  - Major detector and accelerator upgrade from Belle and KEKB—pioneering nano-beam collisions
  - SuperKEKB holds the world-record luminosity of 5.319×10^{34} cm^{-2} s^{-1}

Belle II @SuperKEKB

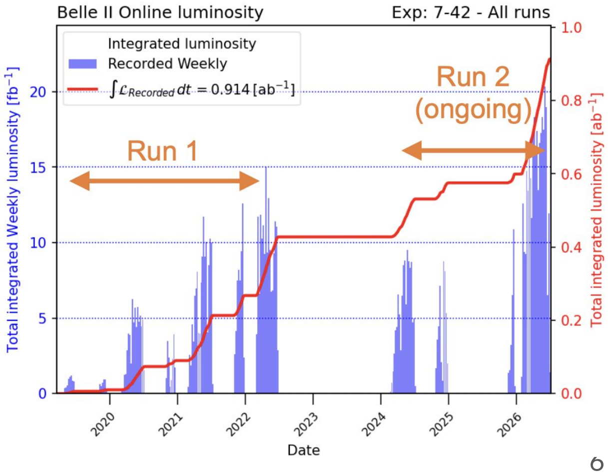
Luminosity frontier e+e- collider operating at or near Υ(4S)



$$e^+e^- \to \Upsilon(4S) \sim 1.1 \text{ nb}$$
$$\Upsilon(4S) \to B\bar{B} \quad > 96\,\%$$



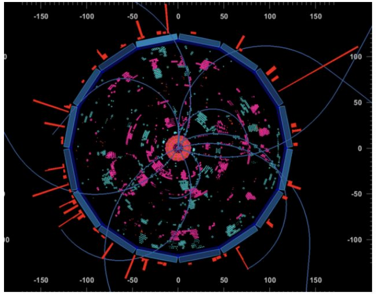
- Belle (1999–2010) collected 1040 fb^{-1}
- Belle II at SuperKEKB (2019–present)
    - Run 1 integrated luminosity: 424 fb^{-1}
    - Run 2 integrated luminosity: 490 fb^{-1}
      (Higher lumi but larger background)
    - World's largest Υ(4S) sample

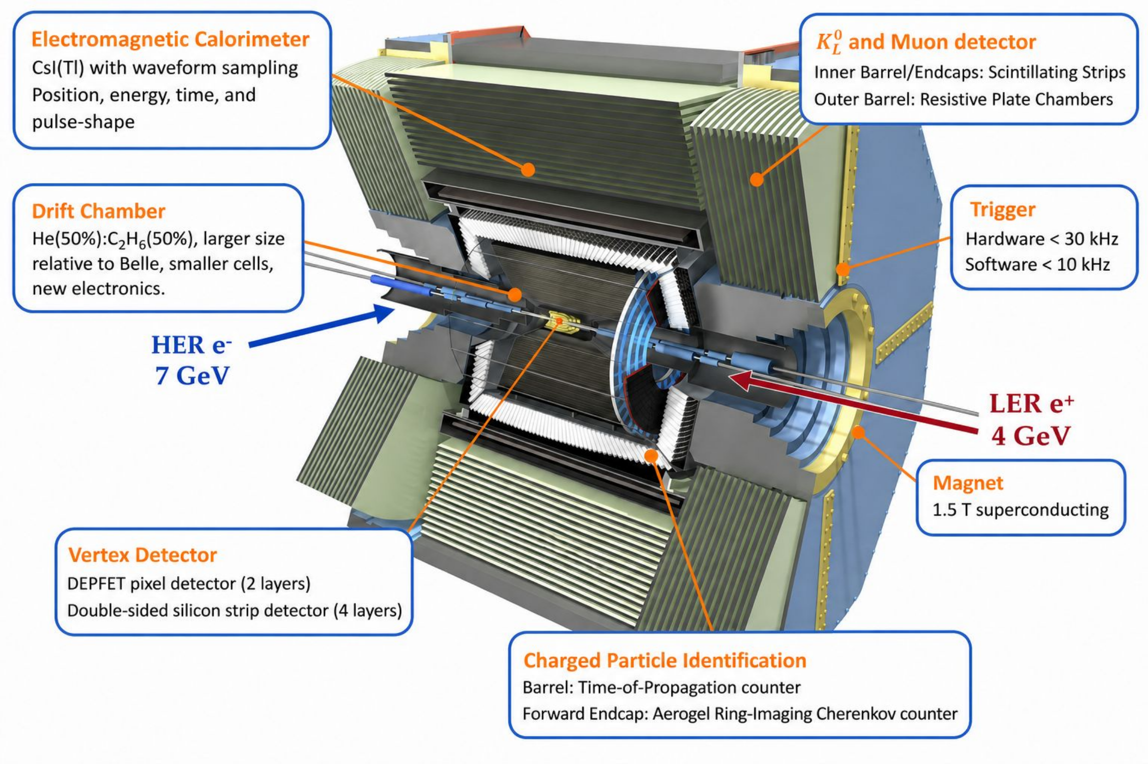


The Belle II detector

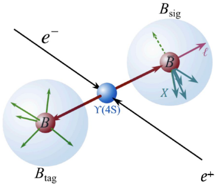
Precise determination of missing energy/momentum:

- Minimal collision pile-up
- Well-known initial collision energy and momentum
- Hermetic detectors with high detection efficiency for charged and neutral particles



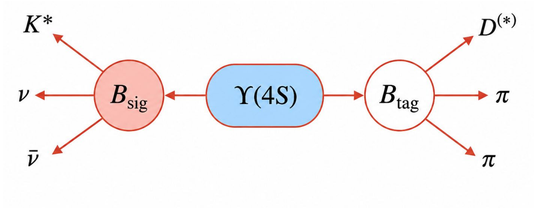


B meson tagging @Belle II



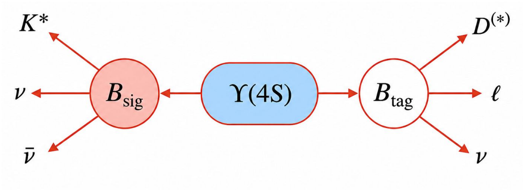
Hadronic B-tagging

Fully reconstruct B_{tag} in hadronic modes
Strongest kinematic constraints
High purity, lowest efficiency



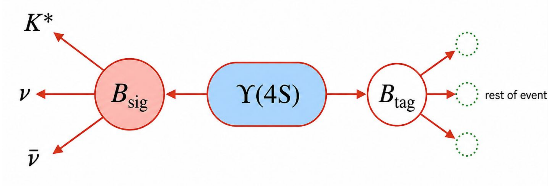
Semileptonic B-tagging

Reconstruct $B_{tag} \rightarrow D^{(*)}\ell\nu$
One additional neutrino on the tag side
Intermediate purity and efficiency



Inclusive B-tagging

Reconstruct the signal-side $K^{(*)}$ only
Use the rest of the event as the tag side
Highest efficiency, weakest constraints



PURITY + KINEMATIC CONSTRAINT

HIGHEST — INTERMEDIATE

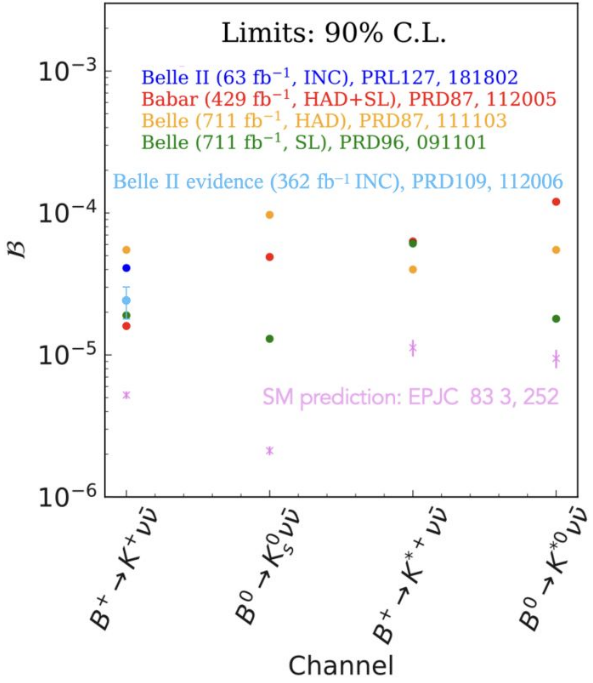
EFFICIENCY

INTERMEDIATE — HIGHEST

Complementary samples provide different balances of efficiency and background rejection

Experimental status

- $\mathcal{B}(B^+ \to K^+\nu\bar{\nu}) = [2.3 \pm 0.5\,(\text{stat})\,^{+0.5}_{-0.4}\,(\text{syst})] \times 10^{-5}$
  PRD 109, 112006 (2024), [Inclusive tag, 362 fb^{-1}]
- $\mathcal{B}(B^0 \to K^0_S\nu\bar{\nu}) < 1.3 \times 10^{-5}$
  PRD 96, 091101 (2017) [SL tag, 711 fb^{-1}]
- $\mathcal{B}(B^+ \to K^{*+}\nu\bar{\nu}) < 4.0 \times 10^{-5}$
  PRD 87, 111103 (2013) [Hadronic tag, 711 fb^{-1}]
- $\mathcal{B}(B^0 \to K^{*0}\nu\bar{\nu}) < 1.8 \times 10^{-5}$
  PRD 96, 091101 (2017) [SL tag, 711 fb^{-1}]



*Only latest results/stringent limits are shown

$B^+ \to K^+\nu\bar{\nu}$: overview

[PRD 109, 112006 (2024)](#) 365 fb^{-1}

Belle II

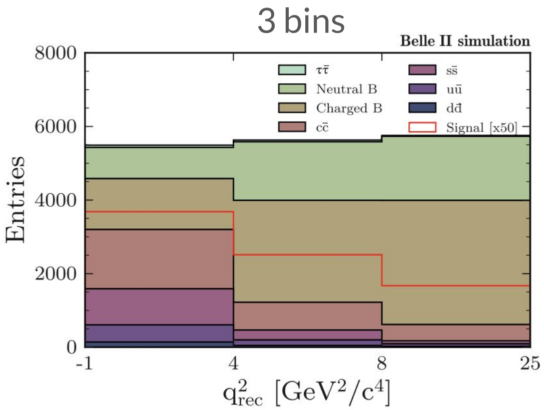
Incl. tag

- Tagging: explored (almost) statistically independent two methods (inclusive vs hadronic)
- Inclusive tagged is the main analysis, cross-check with hadronic tagged analysis
- Basic selection to identify a prompt K^+
- Two-stage BDT: event skimming followed by background rejection using signal-kaon, event-shape, and rest-of-event (ROE) information
- Signal extraction from a binned maximum likelihood fit in bins of q^2 x $\eta(BDT_2)$

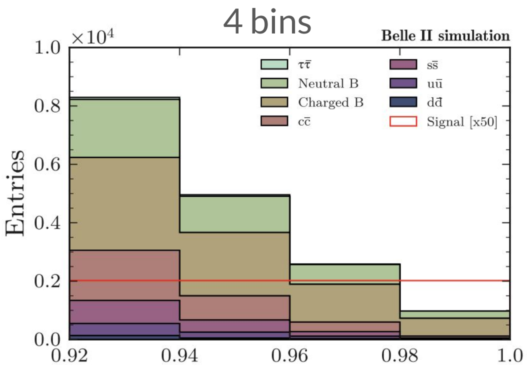
q^2_{rec}: squared invariant mass of the system recoiling against signal kaon

$\eta(BDT_2)$: fraction of events passing a given BDT_2 requirement—equivalent to the BDT selection efficiency at that value

3 bins



4 bins



$\eta(BDT_2)$

DESY.

PRD 109, 112006 (2024)

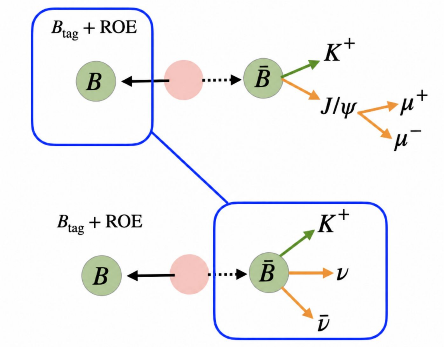
365 fb^{-1}

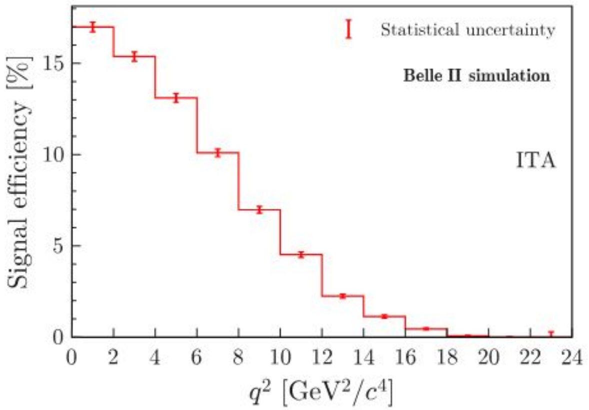
Incl. tag

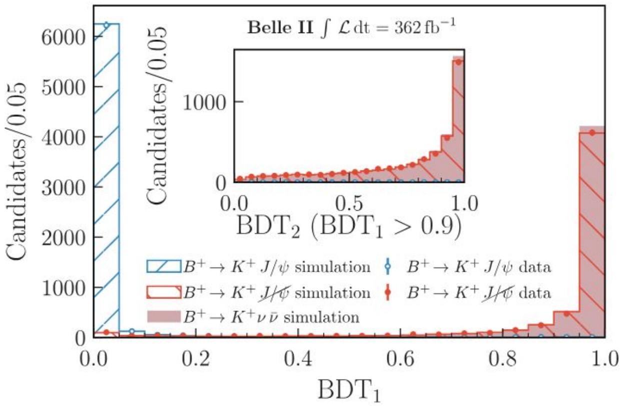
$B^+ \to K^+\nu\bar{\nu}$: efficiency validation

Efficiency validated using the embedding method:

- Obtain "clean" ROE from pure $B^+ \to K^+J/\psi$, with $J/\psi \to \mu^+\mu^-$
- Combine with simulated-signal $B^+ \to K^+\nu\bar{\nu}$ in simulation and data
- Validate signal selection efficiency and BDT2 distribution on data
- Data/MC efficiency ratio: 1.00 ± 0.03



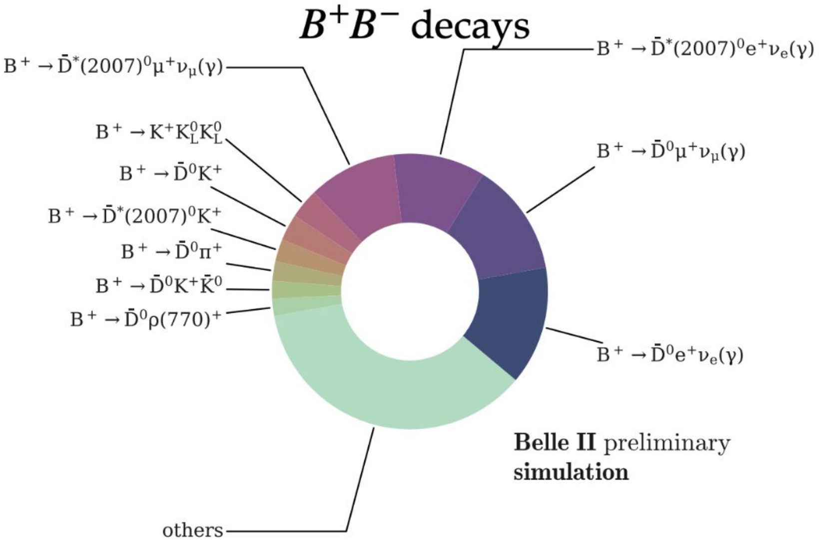


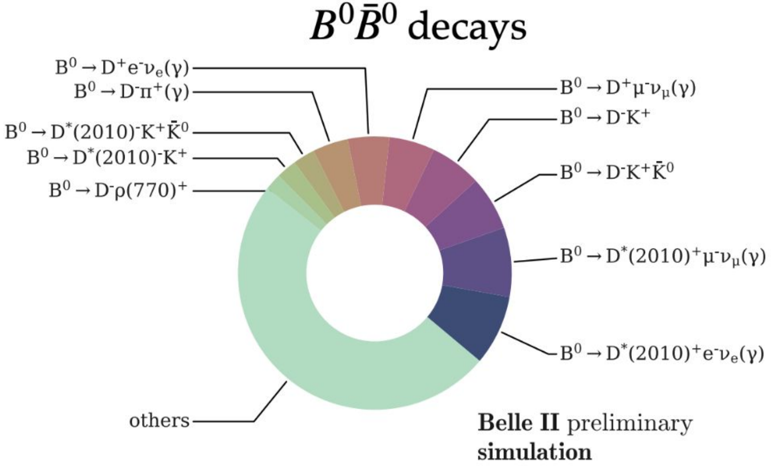


Good data-simulation agreement

$B^+ \to K^+\nu\bar{\nu}$: backgrounds

- Continuum ($\bar{q}q$): 40%
- B-meson decays: 60%
  - 47% from semileptonic decays with $D \to KX$
  - 52% from hadronic decays involving D and K



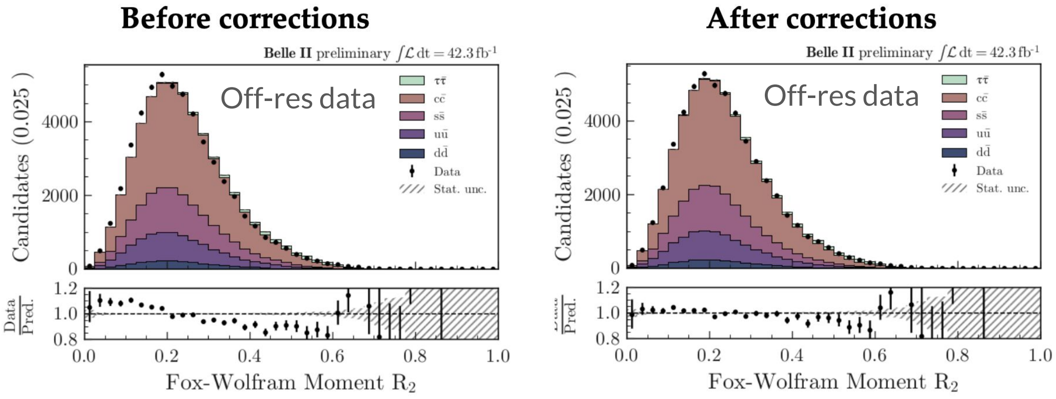


PRD 109, 112006 (2024)   365 fb^{-1}

Incl. tag

$B^+ \to K^+ \nu\bar{\nu}$: continuum background

- Use Off-resonance data (collected 60 MeV below the Υ(4S) resonance) to validate continuum simulation
- Discrepancies in:
  - Normalization (data 40% larger) : can be improved in future with better fragmentation modeling of Pythia
  - Shape: event weights derived following J. Phys.: Conf. Ser. 368 012028



Corrections improve data-MC agreement

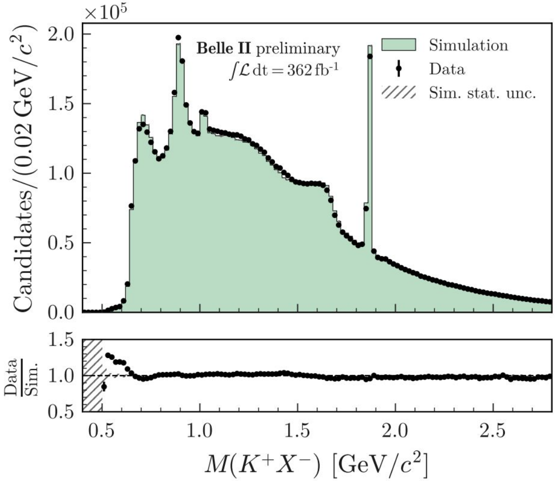
$B^+ \to K^+\nu\bar{\nu}$: BBbar background

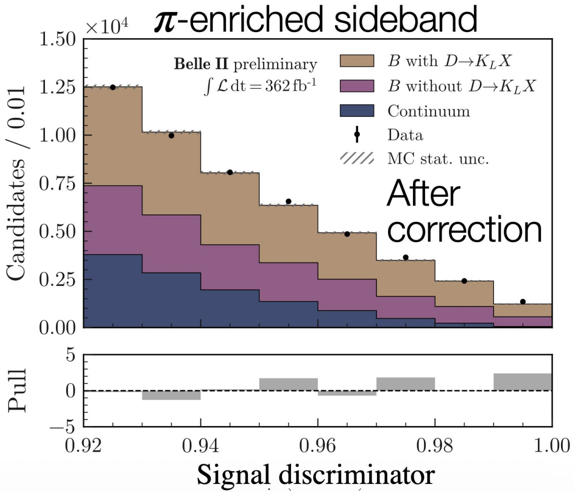
PRD 109, 112006 (2024)

365 fb^{-1}

Incl. tag

- Semileptonic B decays with K coming from D are validated by looking at the invariant mass of signal K and ROE charged particle
- Pion and lepton enriched sideband samples to validate modeling of $B \to X_c(\to K_L + X)$ decays: data favors 1.3x scaling-up: can be improved via better KL veto, modeling and more control sample





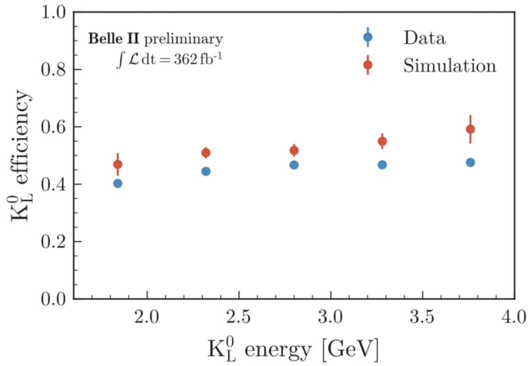
$B^+ \to K^+\nu\bar{\nu}$: backgrounds (cont...)

PRD 109, 112006 (2024)

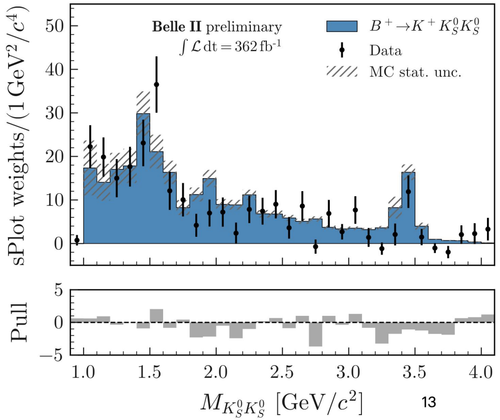
365 fb^{-1}

Incl. tag

- Undetected K_L's are a critical background
  - Use simple-kinematic, low-background $e^+e^- \to \gamma\varphi(\to K_L K_S)$ process to validate modeling of K_L detection efficiency
  - 17% inefficiency in data wrt simulation
  - Note: KLM info is not used here, can be used for better modeling



- $B^+ \to K^+K^0\bar{K}^0$ can mimic the signal and is poorly constrained
  - Use BaBar [PRD 85 (2012), 112010] $B^+ \to K^+K_SK_S$ to model $B^+ \to K^+K_LK_L$
  - Model $B^+ \to K^+K_LK_S$ by using inputs from $B^+ \to K^+K_SK_S$ and $B^0 \to K_SK^+K^-$ decays
  - Our models reproduce the data



13

- Similar treatment for $B^+ \to K^+$ nnbar decays

DESY.

$B^+ \to K^+ \nu\bar{\nu}$: closure test

PRD 109, 112006 (2024)

365 fb^{-1}

Incl. tag

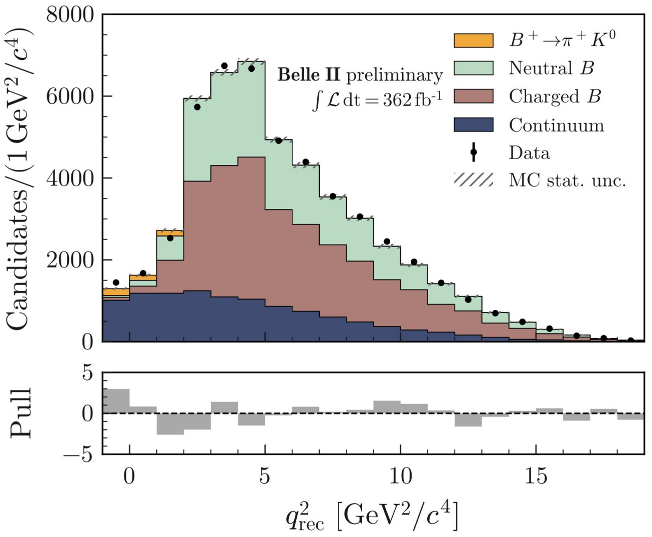
Measure known decay mode to validate the inclusive tagging method

- Minimally adapt $B^+ \to K^+ \nu\bar{\nu}$ to measure BF($B^+ \to \pi^+ K^0$)
- $B^+ \to \pi^+ K^0$ has similar branching fraction to SM $B^+ \to K^+ \nu\bar{\nu}$

BF($B^+ \to \pi^+ K^0$) = (2.5 +/- 0.5) x 10^{-5}

consistent with PDG [(2.38 +/- 0.08) x 10^{-5}]

Successful closure test



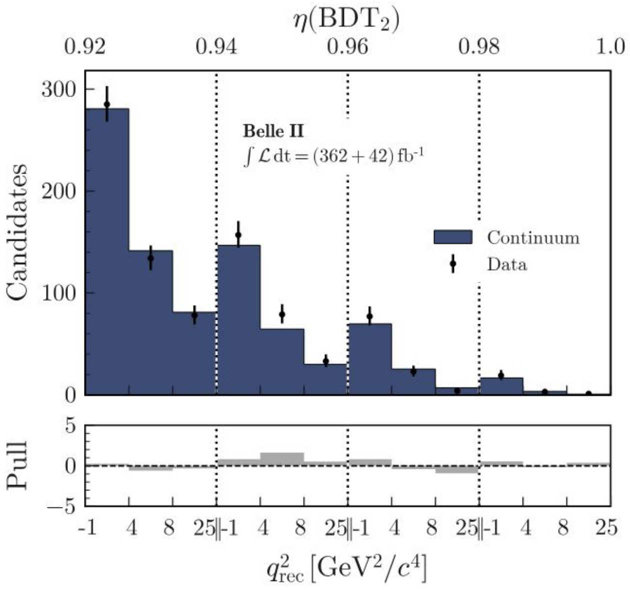
$B^+ \to K^+\nu\bar{\nu}$: signal extraction fit

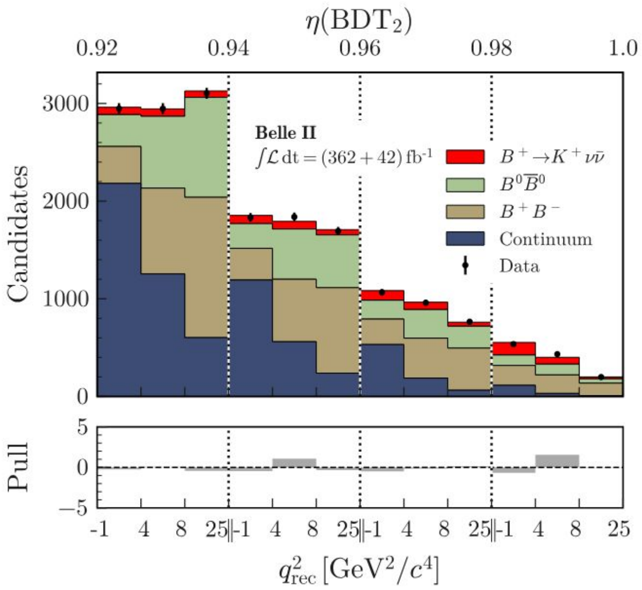
[PRD 109, 112006 (2024)]

365 fb^{-1}

Incl. tag

- Post-fit distributions for signal and background
- Fit performed in both on-resonance and off-resonance data





$B^+ \to K^+ \nu\bar{\nu}$: systematics

PRD 109, 112006 (2024)

365 fb^{-1}

Belle II

Incl. tag

Source	Correction	Uncertainty type, parameters	Uncertainty size	Impact on σ_μ
Normalization of $B\bar{B}$ background		Global, 2	50%	0.90
Normalization of continuum background		Global, 5	50%	0.10
Leading B-decay branching fractions		Shape, 6	$O(1\%)$	0.22
Branching fraction for $B^+ \to K^+ K^0_L K^0_L$	q^2 dependent $O(100\%)$	Shape, 1	20%	0.49
p-wave component for $B^+ \to K^+ K^0_S K^0_L$	q^2 dependent $O(100\%)$	Shape, 1	30%	0.02
Branching fraction for $B \to D^{**}$		Shape, 1	50%	0.42
Branching fraction for $B^+ \to K^+ n\bar{n}$	q^2 dependent $O(100\%)$	Shape, 1	100%	0.20
Branching fraction for $D \to K^0_L X$	+30%	Shape, 1	10%	0.14
Continuum-background modeling, $\mathrm{BDT_c}$	Multivariate $O(10\%)$	Shape, 1	100% of correction	0.01
Integrated luminosity		Global, 1	1%	<0.01
Number of $B\bar{B}$		Global, 1	1.5%	0.02
Off-resonance sample normalization		Global, 1	5%	0.05
Track-finding efficiency		Shape, 1	0.3%	0.20
Signal-kaon PID	p, θ dependent $O(10\text{–}100\%)$	Shape, 7	$O(1\%)$	0.07
Photon energy		Shape, 1	0.5%	0.08
Hadronic energy	−10%	Shape, 1	10%	0.37
K^0_L efficiency in ECL	−17%	Shape, 1	8.5%	0.22
Signal SM form-factors	q^2 dependent $O(1\%)$	Shape, 3	$O(1\%)$	0.02
Global signal efficiency		Global, 1	3%	0.03
Simulated-sample size		Shape, 156	$O(1\%)$	0.52

Improve through

- → uncertainty on leading B only (Normalization of $B\bar{B}$ background)
- → update to recent precise measurements (Leading B-decay branching fractions)
- → KL veto/ improve modeling (Branching fraction for $B^+ \to K^+ K^0_L K^0_L$)
- → update BF and uncertainty to recent precise measurements (Branching fraction for $B \to D^{**}$)

$B^+ \to K^+\nu\bar{\nu}$: results

PRD 109, 112006 (2024)

365 fb^{-1}

Incl. tag

Inclusive tag:

$\mathcal{B} = (2.7 \pm 0.5 \pm 0.5) \times 10^{-5}$

Excess significance: 3.5σ

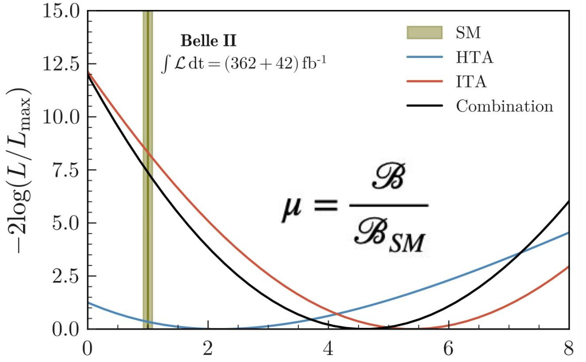
SM deviation: 2.9σ

Hadronic tag:

$\mathcal{B} = (1.1^{+0.9}_{-0.8}\,{}^{+0.8}_{-0.5}) \times 10^{-5}$

Excess significance: 1.1σ

SM deviation: 0.6σ



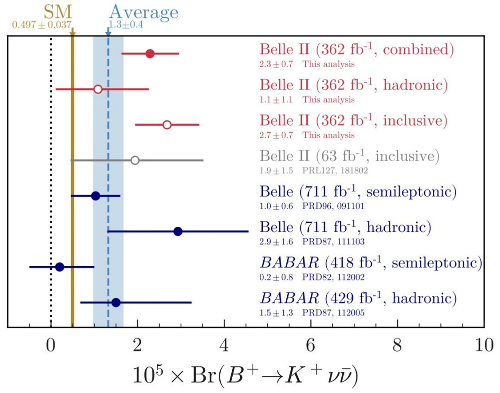
Combination: common events excluded from the inclusive sample

Combined $\mathcal{B} = (2.3 \pm 0.5^{+0.5}_{-0.4}) \times 10^{-5}$

Significance of the excess: 3.5σ

Deviation from the SM: 2.7σ

First evidence for $B^+ \to K^+\nu\bar{\nu}$



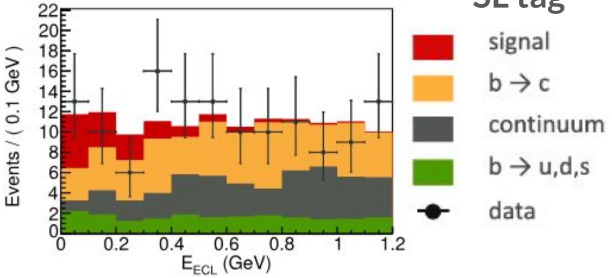
$B^+ \to K^+\nu\bar{\nu}$: comparison with SL tag analysis

711 fb^{-1}

PRD 96, 091101 (2017)

SL tag

- Companion B reconstructed through semileptonic $B_{tag} \to D^{(*)}\ell\nu$ decays
- Full Belle dataset used—approximately twice the size of the Belle II inclusive-tag sample
- No significant signal observed; 90% CL upper limit: $\mathcal{B}(B^+ \to K^+\nu\bar{\nu}) < 1.9 \times 10^{-5}$
- Systematic uncertainty comparable to Belle II, but arising from different sources
- Statistical uncertainty is nearly twice as large as in the Belle II analysis



(a) $B^+ \to K^+\nu\bar{\nu}$

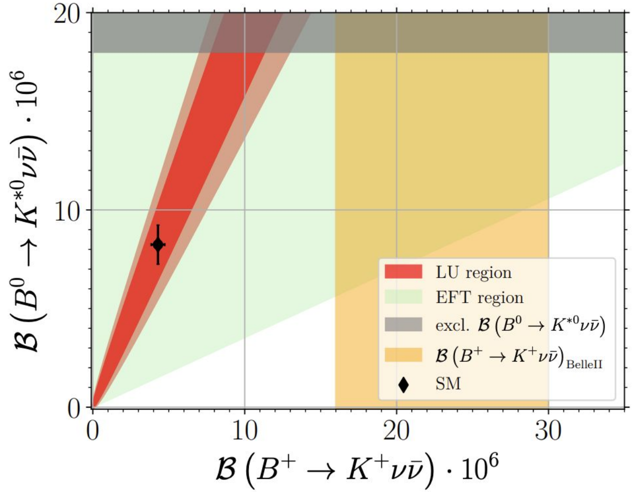
	$K^+\nu\bar{\nu}$
K_L^0 veto	0.2
Fixed fractions	0.4
Continuum scaling	2.0
Tag efficiency correction	0.5
Shape uncertainty	2.6
Fit bias	0.2
Total	3.4

What about other decays?

The lepton-flavor-universal interpretation of the Belle II $B^+ \to K^+\nu\bar{\nu}$ result is already constrained by the Belle $B^0 \to K^{*0}\nu\bar{\nu}$ limit

- $B \to K\nu\bar{\nu}$ and $B \to K^*\nu\bar{\nu}$ probe different combinations of left- and right-handed interactions
- $B \to K\nu\bar{\nu}$ probes their sum, while $B \to K^*\nu\bar{\nu}$ mainly probes their difference
- Combining both probes the interaction structure and lepton-flavor universality

PRD 109 (2024) 015006



– New invisible-particle scenarios compatible with the $B^+ \to K^+ + E_{miss}$ excess predict markedly different $\mathcal{B}(B^0 \to K^{*0} + E_{miss})$ and q^2 distributions [Phys. Rev. D 112, 035010 (2025)]

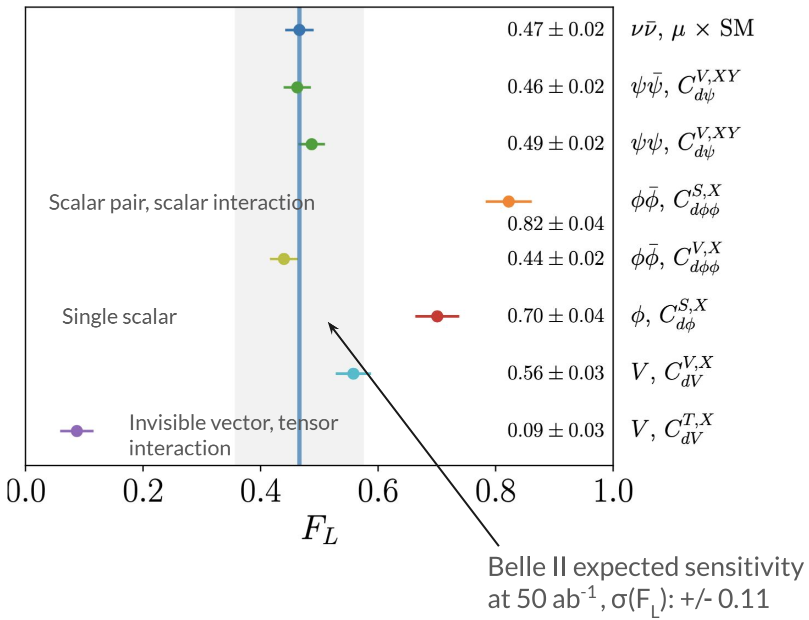
– $B \to K^{(*)}\nu\bar{\nu}$ provides an independent cross-check of $B^+ \to K^+\nu\bar{\nu}$ with different backgrounds and reconstruction systematics

K* polarization (F_L)

- F_L is the fraction of $B \to K^* \nu\bar{\nu}$ decays in which the K* is longitudinally polarized, Γ_L/Γ
- It is a ratio: several normalization and parametric uncertainties cancel
- SM prediction is very precise: $F_L = 0.47 \pm 0.03$
- Extracted from the K* helicity-angle distribution
- Particularly sensitive to right-handed currents and the Lorentz structure of new interactions
- Complementary to $\mathcal{B}(B \to K^* \nu\bar{\nu})$

Branching fraction measures the new physics rate; F_L probes the chirality and structure

[Phys. Rev. D 112, 035010 (2025)]



Predictions for $\langle F_L \rangle$ vary widely among scenarios compatible with the $B \to K^+ + E_{miss}$ excess, making K* polarization a powerful probe of the invisible interaction

Physics beyond SM

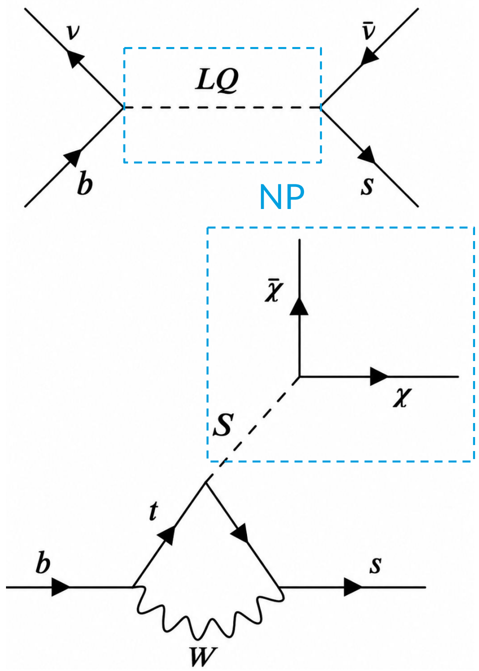
[PRD 109 (2024) 075004]

New particles can modify $B \to K^{(*)}$ + missing energy through:

- **New short-distance interactions:**
  Leptoquarks or Z′-like mediators modify the $b \to s\nu\bar{\nu}$ amplitude
- **New light invisible final states:**
  A new mediator S can decay into dark-sector particles $\chi\bar{\chi}$, producing $B \to K^{(*)}\chi\bar{\chi}$ that mimics $\nu\bar{\nu}$ but produces a different missing-mass spectrum

Other interpretations for K^+ excess[arXiv:2402.05901, JHEP 06 (2024) 172, arXiv:2309.12741]**:**

- Dark photons
- Light dark matter
- ALPs
- Sterile neutrinos
- Higgs portals



Rates, q^2 distributions, and K^* polarization distinguish these scenarios
Plenty of opportunities to probe the SM and explore NP

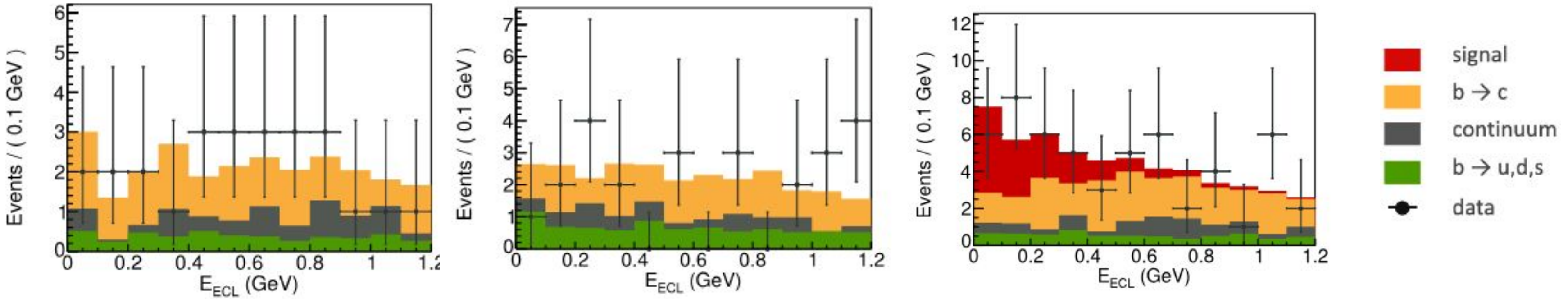
$B \to K^{(*)}\nu\bar{\nu}$: experimental status

PRD 96, 091101 (2017)

711 fb^{-1}

SL tag

- Tag the companion B, $B_{tag} \to D^{(*)}\ell\nu$ semileptonic decays
- Reconstruct the signal side K_S^0,$K^{(*)}$; require no additional tracks or π^0 candidates
- Suppress continuum and generic-BBbar events suppressed via neural networks; E_{miss} > 2.5 GeV
- Extract signal via binned likelihood fit to the residual calorimeter energy (E_{ECL}) distribution



(b) $B^0 \to K_S^0 \nu\bar{\nu}$ (d) $B^0 \to K^{*0}\nu\bar{\nu}$ (c) $B^+ \to K^{*+}\nu\bar{\nu}$

90% UL: $\mathcal{B}(B^0 \to K_S^0\nu\bar{\nu}) < 1.3 \times 10^{-5}$ $\mathcal{B}(B^0 \to K^{*0}\nu\bar{\nu}) < 1.8 \times 10^{-5}$ $\mathcal{B}(B^+ \to K^{*+}\nu\bar{\nu}) < 6.1 \times 10^{-5}$

upward fluctuation weakens the observed limit

Expected Belle II precision

Belle II snowmass white paper: arxiv:2207.06307

The "improved" scenario assumes a 50% increase in signal efficiency for the same background level:

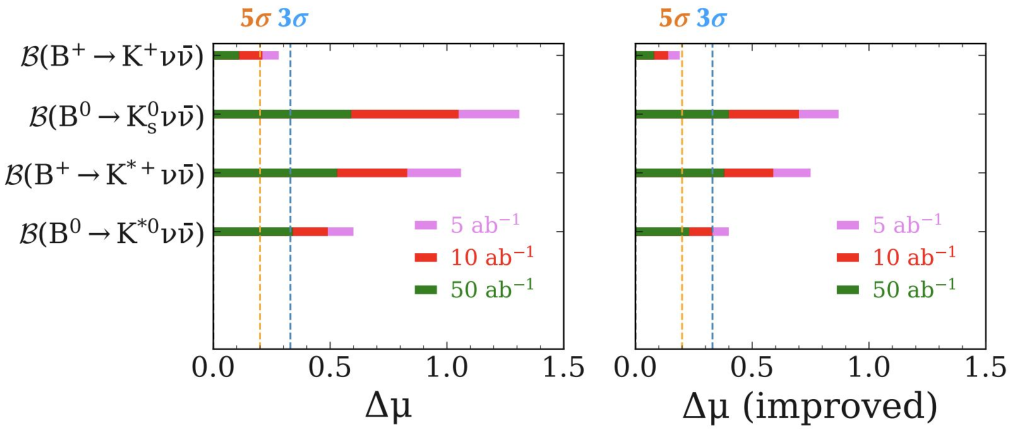
- Better background suppression
- More tagging approaches
- Improved systematic uncertainties

Belle dataset offers additional sensitivity but requires careful treatment of legacy simulation and data–MC corrections

Ongoing efforts to confirm K+ results:

- Analyze a larger dataset
- Study additional $B \to K^{(*)}\nu\bar{\nu}$ channels
- Use complementary tagging approaches (SL tag)

Belle II snowmass paper: baseline and improved scenarios



$\Delta\mu$ = uncertainty on signal strength assuming SM

DESY.

Beyond K and K*: higher kaon resonances

- The $B^+ \to K^+ \nu\bar{\nu}$ excess motivates testing the $b \to s\nu\bar{\nu}$ transition in several independent hadronic final states
- Measurements of K and K*(892) alone cannot determine whether an enhancement is common across $b \to s\nu\bar{\nu}$ decays or specific to one hadronic state
- Above $M_{X_s} \approx 1$ GeV, the strange hadronic spectrum includes:
- – Axial-vector states: $K_1(1270)$, $K_1(1400)$
  – Vector, scalar and tensor K** resonances
  – Nonresonant, higher-multiplicity X_s final states
- These states provide complementary spin-parity information and populate different regions of the hadronic-mass and q^2 spectra

Understanding the resonance structure above 1 GeV is essential for connecting exclusive K and K* measurements to the inclusive $b \to s\nu\bar{\nu}$ picture

Summary

- $B \to K^{(*)}\nu\bar{\nu}$ decays are theoretically clean probes of the FCNC transition $b \to s\nu\bar{\nu}$ and potential invisible new physics
- Belle II reported the first evidence for $B^+ \to K^+\nu\bar{\nu}$:
  $\mathcal{B} = [2.3 \pm 0.5\,(\text{stat})\,^{+0.5}_{-0.4}\,(\text{syst})] \times 10^{-5}$
  – 3.5σ signal significance
  – 2.7σ above the SM prediction
- Belle II continues to make strong progress in Run 2. Despite the higher beam-induced background, detector and data quality remain suitable for $B \to K\nu\bar{\nu}$ analyses
- Independent measurements of $B^0 \to K^0\nu\bar{\nu}$ and $B \to K^*\nu\bar{\nu}$ are essential to confirm the excess and test its universality
- Larger datasets, complementary tagging methods and improved background suppression will significantly increase sensitivity

With Run 2 data and an expanding set of channels, Belle II is entering a precision era for $B \to K^{(*)}\nu\bar{\nu}$ measurements

Backup

$B^0 \to K^{*0}\nu\bar{\nu}$: experimental status

[PRD 96, 091101 (2017)]

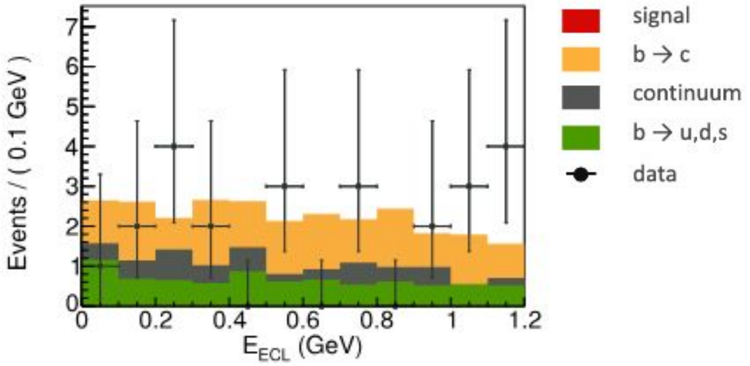
711 fb^{-1}

SL tag

Similar analysis strategy as of $B^0 \to K$□$^0 \nu\bar{\nu}$

- Tag the companion B
  $B_{tag} \to D^{(*)}\ell\nu$ across 108 semileptonic decay channels
- Reconstruct the signal side
  $K^{*0} \to K^+\pi^-$; invariant mass retained as a classifier input
- Suppress background
  Continuum and generic-BBbar events suppressed via neural networks; veto extra tracks and π^0
- Extract the signal
  Extended binned likelihood fit to the residual calorimeter energy (E_{ECL}) distribution

No significant excess, N_{sig} = −2.0 ± 3.6 (stat.) ± 1.8 (syst.)



(d) $B^0 \to K^{*0}\nu\bar{\nu}$

The fitted signal component is consistent with zero

90% CL upper limit, $\mathcal{B}(B^0 \to K^{*0}\nu\bar{\nu}) < 1.8 \times 10^{-5}$, most stringent limit on this decay so far

$B^+ \to K^{*+} \nu\bar{\nu}$: experimental status

PRD 87, 111103 (2013)

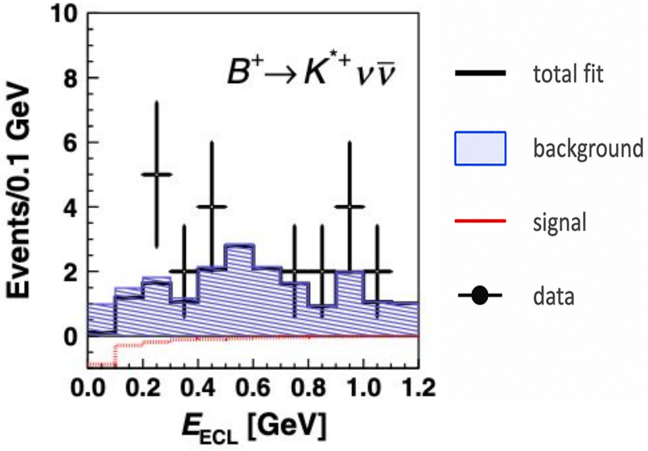
711 fb^{-1}

Had. tag

Analysis strategy

- Fully reconstruct the tag-side B
  Neural-network with full reconstruction in 1104 exclusive hadronic modes
- Reconstruct the signal side
  $K^{*+} \to K^0_S\pi^+$ or $K^+\pi^0$; $|m(K\pi) - m(K^*)| < 75$ MeV
- Suppress background
  Neural-network to suppress continuum; $1.6 < p(K^*) < 2.5$ GeV/c; veto extra particles
- Extract the signal
  Extended binned likelihood fit to the residual calorimeter energy (E_{ECL}) distribution in the range 0–1.2 GeV

No significant excess, $N_{sig} = -1.7\ (+1.7/-1.1)$ (stat.) ± 1.5 (syst.)



Best-fit signal yield is below zero; no evidence for signal

90% CL upper limit, $\mathcal{B}(B^+ \to K^{*+}\nu\bar{\nu}) < 4.0 \times 10^{-5}$, most stringent limit so far

$B^+ \to K^+ \nu\bar{\nu}$: reinterpretation

PRD 112 (2025) 092016

365 fb^{-1}

Test alternative models for the evidence by reweighting the signal kinematic distribution (squared dineutrino mass) relative to the SM [EPJC 84 (2024) 693]

Consider the Weak Effective Theory with Wilson coefficients for dimension-six operators: $C_{V[L,R]}$(vector), $C_{S[L,R]}$ (scalar) C_{TL}(tensor); L/R = left-/right-handed chirality

In SM: C_{VL} = 6.6 ± 0.1; rest C_i = 0 [PRD 107 (2023) 014511]

The Bayesian posterior prefers larger vector and nonzero tensor contributions relative to the SM: **measurement of $\mathcal{B}$ ($B^0 \to K^* \nu\bar{\nu}$) is crucial**

Publicly available analysis tools and likelihood enable model reinterpretation [HEPData]