

2nd OPEN Belle II Physics Week



Organizers : A. Gaz, E. Kou, P. Urquijo

Scientific Committee : V. Bhardwaj, G. Casarosa,
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Local Organizer : S. Hashimoto

Secretary : M. Ohishi

Welcome!

- This is the 2nd OPEN Belle II Physics Week;
- The Physics Weeks follow the series of “B2TiP Meetings”, a collaborative effort involving theorists, Belle II experimentalists, and other experimentalist to develop the Physics Case of Belle II;
- We want to keep this spirit, mixing pedagogical lectures with more specialized seminars and hands-on exercises, and lots and lots of discussion!
- Goal: focus on what’s most interesting these days, how we can maximize the physics impact of the first Belle II data and prepare for the ultimate precision;
- This year’s theme:

arXiv: 1808.10567
DOI: 10.1093/ptep/ptz106

200+ citations

KEK Preprint 2018-27
BELLE2-PAPER-2018-001
FERMILAB-PUB-18-398-T
JLAB-THY-18-2780
INT-PUB-18-047
UWThPh 2018-26

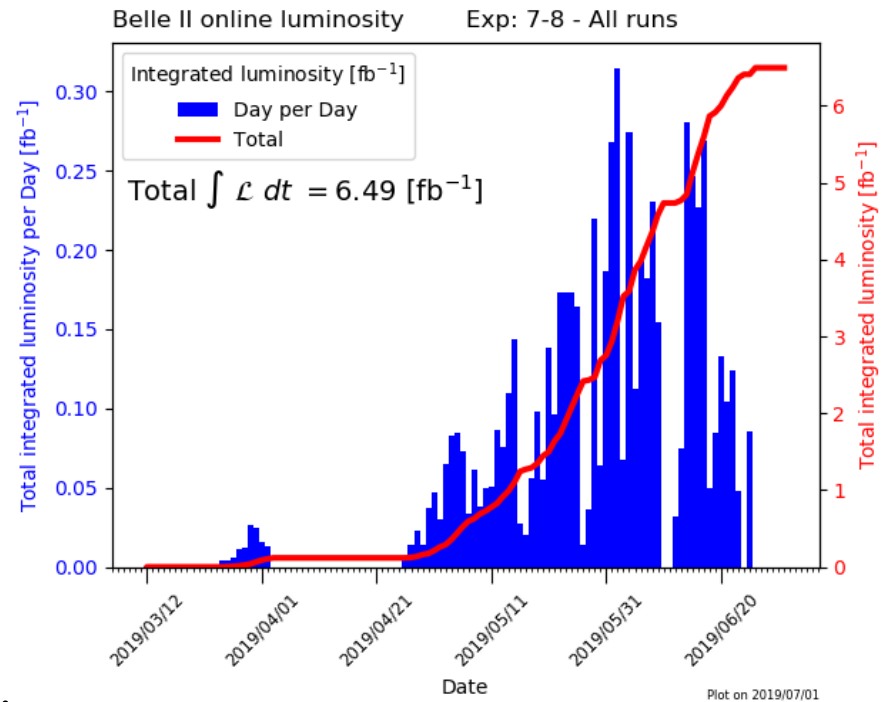
The Belle II Physics Book

E. Kou^{74,†}, P. Urquijo^{143,§,†}, W. Altmannshofer^{133,¶}, F. Beaujean^{78,¶}, G. Bell^{120,¶}, M. Beneke^{112,¶}, I. I. Bigi^{146,¶}, F. Bishara^{148,16,¶}, M. Blanke^{49,50,¶}, C. Bobeth^{111,112,¶}, M. Bona^{150,¶}, N. Brambilla^{112,¶}, V. M. Braun^{43,¶}, J. Brod^{110,133,¶}, A. J. Buras^{113,¶}, H. Y. Cheng^{44,¶}, C. W. Chiang^{91,¶}, M. Ciuchini^{58,¶}, G. Colangelo^{126,¶}, H. Czyz^{154,29,¶}, A. Datta^{144,¶}, F. De Fazio^{52,¶}, T. Deppisch^{50,¶}, M. J. Dolan^{143,¶}, J. Evans^{133,¶}, S. Fajfer^{107,139,¶}, T. Feldmann^{120,¶}, S. Godfrey^{7,¶}, M. Gronau^{61,¶}, Y. Grossman^{15,¶}, F. K. Guo^{41,132,¶}, U. Haisch^{148,11,¶}, C. Hanhart^{21,¶}, S. Hashimoto^{30,26,¶}, S. Hirose^{88,¶}, J. Hisano^{88,89,¶}, L. Hofer^{125,¶}, M. Hoferichter^{166,¶}, W. S. Hou^{91,¶}, T. Huber^{120,¶}, S. Jaeger^{157,¶}, S. Jahn^{82,¶}, M. Jamin^{124,¶}, J. Jones^{102,¶}, M. Jung^{111,¶}, A. L. Kagan^{133,¶}, F. Kahlhoefer^{1,¶}, J. F. Kamenik^{107,139,¶}, T. Kaneko^{30,26,¶}, Y. Kiyo^{63,¶}, A. Kokulu^{112,138,¶}, N. Kosnik^{107,139,¶}, A. S. Kronfeld^{20,¶}, Z. Ligeti^{19,¶}, H. Logan^{7,¶}, C. D. Lu^{41,¶}, V. Lubicz^{151,¶}, F. Mahmoudi^{140,¶}, K. Maltman^{171,¶}, S. Mishima^{30,¶}, M. Misiak^{164,¶},

Time dependent analysis and Charm Physics

Belle II Status

- Detector: **basically running stably^(TM)**;
- Accelerator: instantaneous luminosity slowly ramping up, mostly limited by beam backgrounds;
- “Early Phase3” dataset: in Spring 2019 we collected $\sim 6.5 \text{ fb}^{-1}$;
- To put things into perspective: this corresponds to $O(1\%)$ of BaBar’s or Belle’s datasets...
- ... and 4 orders of magnitude smaller than our goal;
- Still, physics analysis at Belle II has started!



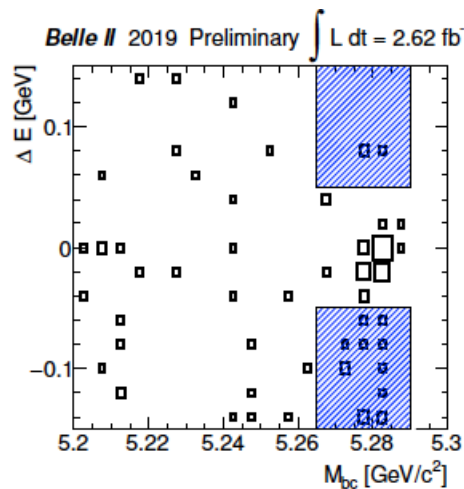
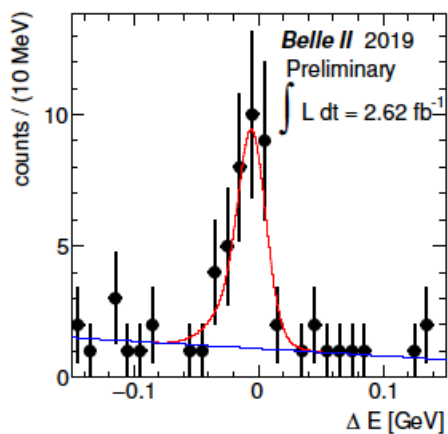
Belle II Status

Rediscovery of $\sin 2\phi_1$ “golden channel”:

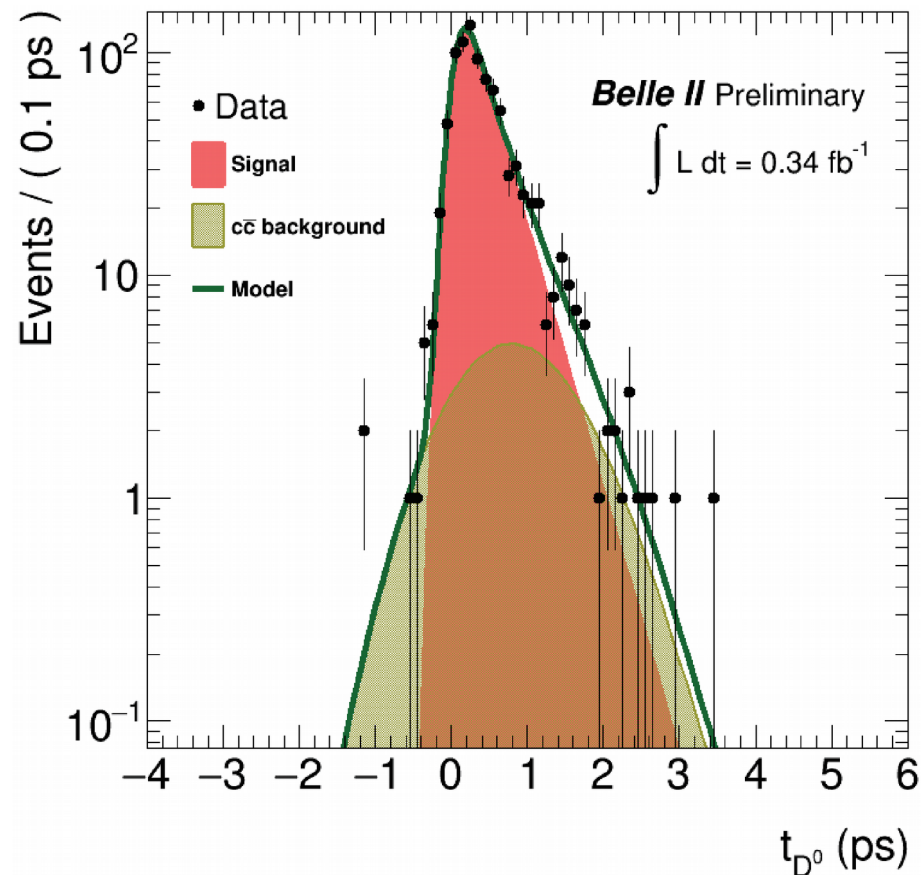
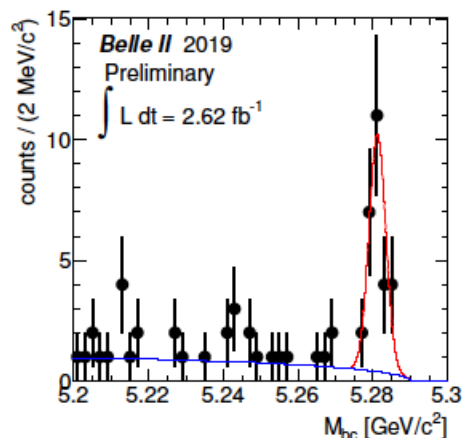


Measurement of D^0 lifetime:

$$\tau = 370 \pm 40 \text{ ps}$$



$$N_{\text{sig}} = 26.9 \pm 5.2$$



Timetable

Monday	Tuesday	Wednesday	Thursday	Friday
Lecture 1 (Petrov)	Lecture 2 (Petrov)	Lecture 3 (Petrov)	B-CPV 2 (Browder)	Hands-on: Lifetimes
Coffee Break				
Topical seminar (Lunghi)	Topical seminar (Tanimoto)	Charm 2 (Golob)	Topical Seminar (Kagan)	Topical seminar (Praz)
Topical seminar (Kobayashi)	Topical seminar (Tonelli)		Topical Seminar (Di Canto)	
Lunch				
Hands-on: PID	Hands-on: Flavor Tagger	Excursion	Hands-on: Vertexing	Overflow / Free
Charm 1 (Golob)	B-CPV 1 (Sakai)		Topical seminar: Dalseno	
Self introduction	Informal session 1		Informal session 2	
Reception				

Hands-on Exercises

- This is mostly meant for Belle II members. You will (only) need a KEKCC account to run the exercises;
- Non Belle II members are welcome to attend the sessions, but we cannot distribute all the material;
- General structure of the hands-on: each tutorial is 90 minutes long (1/3 of general introduction and 2/3 of practical exercise with the Belle II Software);
- Topics:
 - 1) PID (Jan Strube)
 - 2) FlavorTagger (Fernando Abudinen)
 - 3) Vertexing (Francesco Tenchini)
 - 4) Lifetimes (Giulia Casarosa)
- The “sensitive” material will be copied to the internal confluence page:
<https://confluence.desy.de/display/BI/Belle+II+Physics+Weeks+-+Internal+Material>

Informal Sessions

- We encourage everyone to discuss a Physics topic (not necessarily along the theme of this Physics Week);
- Structure: **10 minutes** of presentation, followed by discussion in a relaxed atmosphere. It's not mandatory to attend, but last year these sessions turned out to be interesting and fun!
- Preliminary schedule:

Tuesday:

- 1) R. Schaefer
- 2) J. Koponen
- 3) D. Kalita
- 4) Y.T. Chen
- 5) V. Chekelian

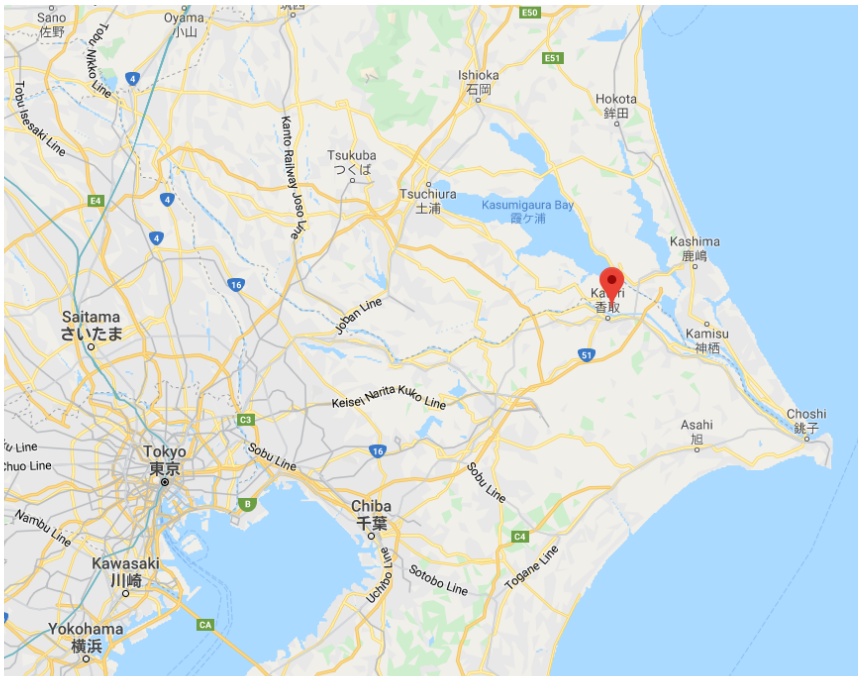
Thursday:

- 1) S. Watanuki
- 2) P. Feichtinger
- 3) M. Goltz
- 4) G. Bailas

- There is still space for a few contributions: please let us know as soon as possible if you want to give a presentation!

Social Events

- **Tonight: Welcome Reception** at the Kenkyu Honkan (main building just across the road);
- **Wednesday afternoon** (only if you registered): **Excursion to Sawara**



(more detailed instructions will follow)

We want your feedback!

- We really want to know what you think;
- We will circulate two questionnaires:
 - What are the most important questions Particle Physics should answer?
 - How was the Physics Week and how can we improve it?
- Please fill and return these questionnaires... and talk to us at any time in the next few days.
- Let's enjoy the Physics Week!