Giulio Dujany

Curriculum Vitae

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Research highlights

$B^+ \to K^+\nu\overline{\nu}$ One of the main analysts that brought the **first evidence** of the $B^+ \to K^+\nu\overline{\nu}$ decay at Belle II. This result shows a 2.7 σ tension with the Standard Model prediction. I am now leading a new search based on a complementary method to corroborate this result and to search for other $B \to K^{(*)}\nu\overline{\nu}$ decays.

$B^0 \to K^*\tau^\pm\mu^\mp$ One of the main analysts that set the **World's best upper limit** on the flavour violating decay $B^0 \to K^*\tau^\pm\mu^\mp$.

$B \to pph^+h^-$ Main analyst of the $B^0_{(s)} \to p\overline{p}h^+h'^-$ branching fraction measurement with the LHCb experiment in which $B^0_s \to ppK^+K^-$, $B^0_s \to ppK^\pm\pi^\mp$, $B^0_s \to pp\pi^+\pi^-$ are **observed for the first time**.

Real time alignment Participated in the real-time alignment and calibration developement and commissioning. This is a **key element of the LHCb data taking strategy since Run 2**, that includes the possibility to run the full reconstruction in the trigger. This allows along with the turbo stream to perform analyses directly on the trigger output with the same "offline" performance. I gave the first conference talk about it.

$R(\chi_b)$ Main analyst of the **World's first measurement** of the production cross section ratio $\sigma(\chi_{b2}(1P))$ / $\sigma(\chi_{b1}(1P))$ in pp collisions at $\sqrt{s} = 8$ TeV with the CMS experiment.

Education and academic career

Since 2019 **Staff Researcher**, *IPHC, CNRS*, France.
Member of the Belle II experiment at SuperKEKB e^+e^- asymmetric collider.

2017-2018 **Postdoc researcher**, *LPNHE, CNRS*, France.
Member of the LHCb experiment at LHC pp collider.

2017 **PhD in Physics**, *University of Manchester*, UK.
Thesis: *Real-time alignment of the LHCb vertex detector and observation of charmless baryonic decays* $B^0_{(s)} \to p\overline{p}h^+h'^-$
Supervisors: George Lafferty, Chris Parkes

2013 **Master Degree in Physics**, *Università degli studi di Torino*, Italy.

2011 **Bachelor Degree in Physics**, *Università degli studi di Torino*, Italy.

Management of research

Since 2023 **Deputy data production coordinator** at the Belle II experiment.

Since 2022 **Director of the Intensity Frontier GDR**.

2020-22 **Calibration software manager** in the Belle II experiment.

2019-21 **Convener of future experiment working group** of the Intensity Frontier GDR.

2018 **Convener of the Tracking, Alignment and Vertexing physics performance working group** of the LHCb experiment.

Awards and grants

2023 PI for IPHC of the **ANR project InvISYble** (*A novel approach to meson or lepton decays to escaping particles*), 464 k€ (167 k€ for IPHC)

2021 PI of the **ANR project FIDDLE** (*Finding invisible decays with deep learning*), 213 k€

2021 PI of the **IdEX Strasbourg University project PROBE** (*CMOS sensor prototype for the upgrade of the vertex detector of Belle II*), 40 k€

2018 **LHCb-UK thesis prize**, UK institutes participating in the LHCb collaboration.

2017 **LHCb Early Career Scientist Prize**, LHCb collaboration.
For my contributions to the real-time alignment and calibration of the vertexing and tracking system of the LHCb experiment.

2015 **Best Physics' Master Thesis**, Università di Torino.
For the best master thesis from the faculty of physics of the University of Torino in the academic year 2012/2013.

Academic activities and event organisations

Supervision Co-supervision of 5 PhD thesis and 11 master internships

Teaching Teacher at **Université de Strasbourg** (*C++ and ROOT for the second year of master 2 PSA (Since 2021) and computational physics for the third year of bachelor (2024)*). Teaching assistant at **University of Manchester** (*maths, astrophysics and cosmology (2017), matlab and C++* (2014)) and **Università di Torino** (*physics for biology students (2013), physics laboratory on electromagnetism (2011) and information technology for physics (2010)*).

Events Part of the organising committee of *Flavor at the Crossroads workshop* (Mainz, 2022), the $b \to sll$ *workshop* (Lyon, 2019) and the *Young Experimentalists and Theorists Institute* (Durham, UK, 2015-17).

Main publications

It is customary in High Energy Physics that all the members of a collaboration sign every paper; I thus have now more than 400 articles that can be found at the `http://inspirehep.net/author/profile/G.Dujany.1`. What follows is a short list of papers, in which I gave a leading contribution.

arXiv:2311.14647 Belle II collaboration. *Evidence for $B^+ \to K^+\nu\bar{\nu}$ decays.* Phys. Rev. D 109, 112006 (2024).

arXiv:2208.14924 J. Kahn et al. *Learning tree structures from leaves for particle decay reconstruction.* Mach. Learn.: Sci. Technol. 3 035012 (2022).

arXiv:2209.09846 LHCb collaboration. *Search for the lepton-flavour violating decays $B^0 \to K^{*0}\tau^{\pm}\mu^{\mp}$.* JHEP 06 143 (2023).

arXiv:2206.08280 Belle II collaboration. *Measurement of the branching fraction of the $B^0 \to K^0_S\pi^0\gamma$ decay using 190 fb^{-1} of Belle II data.* BELLE2-CONF-2022-008.

arXiv:2005.07507 Belle II collaboration. *Measurement of the B^0 lifetime using fully reconstructed hadronic decays in the 2019 Belle II dataset.* BELLE2-CONF-PH-2020-003.

arXiv:1704.08497 LHCb collaboration. *Observation of charmless baryonic decays $B^0_{(s)} \to p\bar{p}h^+h'^-$.* Phys. Rev., D96 :051103(R), (2017).

LHCb-PROC-2015-011 G. Dujany and B. Storaci. *Real-time alignment and calibration of the LHCb Detector in Run II.* J.Phys.Conf.Ser. 664 8, 082010 (2015).

arXiv:1409.5761 CMS collaboration. *Measurement of the production cross section ratio σ(Xb2(1P)) / σ(Xb1(1P)) in pp collisions at $\sqrt{s} = 8$ TeV.* Phys. Lett. B 743 383 (2015).