Conor Fitzpatrick

CONTACT INFORMATION

Particle Physics (Experiments) Group
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EDUCATION

University of Edinburgh, Edinburgh, United Kingdom

Doctor of Philosophy **September 2008 – present**

- Supervisor: Prof. Franz Muheim
- Thesis title: An analysis of the decay $B_s^0 \to J/\psi\,\phi$ with the LHCb experiment
- **First draft submitted**
- Expected completion date: March 2012

Master of Physics with honours **September 2001 – July 2008**

- Supervisor: Dr. Phil Clarke
- MPhys topic: $B_d^0 \to \phi K_S^0$ Selection and Sensitivity study at the LHCb experiment
- Integrated Undergraduate Masters Degree
- Awarded Second class honors, Upper division

AWARDS

Neil Arnott Scholarship, 2007.
Awarded to the most distinguished student in the Physical Laboratory.

RESEARCH

The LHCb Experiment, CERN

β_s analysis (flagship LHCb measurement)

Contributor to the β_s and mixing workgroup which recently released the world's best measurement of the $\mathcal{CP}$-violating phase $\phi_s = -2\beta_s$ in the decay $B_s^0 \to J/\psi\,\phi$ which strongly constrains New Physics. Specific work includes development of the fitter, inclusion of an s-wave component, investigation of background and its handling in the fit, and systematic studies. Presented at 2011 winter and summer conferences (LHCb-CONF-2011-049, LHCb-CONF-2011-006). I presented the first LHCb result at the IoP NPPD 2011.

Prompt Charm Cross-sections at $\sqrt{s}$=7TeV

Performed the first selection and analysis of the channels $D_s^+, D^+ \to \phi\pi^+$ at the LHCb experiment, including a measurement of the D_s and D^+ cross-sections and cross-section ratio. Presented at 2010 summer conferences (LHCb-CONF-2010-013).

Time alignment of the LHCb RICH

Produced the software, analysis and results necessary to time-align the readout of the LHCb RICH Level-0 hardware to within 1ns resolution. This is required to maximise the photon collection efficiency and by extension particle ID efficiency of the RICH.

Shift Leader

The first and one of very few graduate-level students to be trained and deployed in the rôle of Shift Leader for the LHCb experiment. Responsible for the safety of the experiment and efficiency of data collection.

STUDENTSHIPS

University of Edinburgh, Edinburgh, United Kingdom

Summer Student **June 2006 – Sept 2006**

Calibration and testing of Hybrid Photon Detectors for the LHCb RICH in the Photon Detector Test Facility (PDTF) including measurements of quantum efficiency, ion feedback and IV scans for HPDs prior to installation in the RICH.

CERN, Meyrin, Switzerland

Summer Student (PH-ULB) **June 2007 – Sept 2007**

- Topic: Scintillation background studies of the LHCb RICH Čerenkov radiators.
- Supervisor: Olav Ullaland
- Development of a modular Monte-Carlo simulation framework in order to understand the effect of varying gas pressures in the RICH, using C++/ROOT. Experimental verification and calibration using a test environment consisting of a gas vessel, photon detector and α source.

Teaching

University of Edinburgh, Edinburgh, United Kingdom

Tutor and Lab Demonstrator **Sept 2008 – June 2009**

Tutor for undergraduate courses including Physics 1A & Physics 1B, Lab demonstrator for Physics 1 and Electronic Methods in the Physical Laboratory.

Outreach and Voluntary work

Outreach

SCI-FUN & Particle Physics for Scottish Schools **Sept 2006 onwards**

Roadshows bringing Physics to schools throughout Scotland, tailored towards a number of specific age groups.

Edinburgh International Science Festival **Summer 2008, 2009**

Demonstrator at the Particle Physics exhibit, bringing particle physics to thousands of members of the general public of all ages.

Voluntary Positions

Organising Committee, YETI'11, IPPP Durham **January 2011**

Topic: "The Standard Model at the Energy Frontier". The Young Experimentalists and Theorists Institute brings graduate-level theorists and experimentalists together to discuss current topics in Particle Physics.

Programming

C, C++, Maple, Linux shell scripting, Python, LaTeX 2_ε, ROOT, RooFit, Fortran '95/OpenMP, Java

Languages

- **English**: Fluent (Mother tongue)
- **French**: Ability to read and speak French to an intermediate level
- **German**: Ability to read German at an intermediate level, Spoken at a beginner level
- **Italian**: Ability to speak at a beginner level

Hobbies

Cycling, Competitive Cocktail bartending

Selected Talks

1. **"$\mathcal{CP}$ at LHCb"**
   Implications of LHC results for TeV-scale physics, CERN (29 August - 2 September 2011)
2. **"$B_s^0 \to J/\psi\,\phi$ at LHCb "**
   IoP Nuclear and Particle Physics Divisional Conference, Glasgow (4-7 April 2011)
3. **"Charmonium and Heavy Flavour Production at LHCb"**
   The Xth International Conference on Heavy Quarks and Leptons, INFN Frascati (11-15 October 2010)
   PoS(HQL 2010)010

Selected Publications

1. **Measurement of the CP-violating phase ϕ_s in the decay $B_s^0 \to J/\psi\,\phi$**
   R. Aaij *et al.* [LHCb Collaboration].
   arxiv:1112.3183 [hep-ex]
   To be published in Phys. Rev. Lett.
2. **Measurement of the CP violating phase ϕ_s in $B_s^0 \to J/\psi f_0(980)$**
   R. Aaij *et al.* [LHCb Collaboration].
   arxiv:1112.3056 [hep-ex]
   Phys. Lett. **B707** 497505 (2012)
3. **"Tagged time-dependent angular analysis of $B_s^0 \to J/\psi\,\phi$ decays with 337pb^{-1}at LHCb"**
   R. Aaij *et al.* [LHCb Collaboration].
   LHCb-CONF-2011-049
4. **"Tagged time-dependent angular analysis of $B_s^0 \to J/\psi\,\phi$ decays with the 2010 LHCb data"**
   R. Aaij *et al.* [LHCb Collaboration].
   LHCb-CONF-2011-006

5. **"Flavor-untagged angular analysis of $\mathbf{B_d^0 \to J/\psi K^*}$ and $\mathbf{B_s^0 \to J/\psi\, \phi}$ decays"**
R. Aaij *et al.* [LHCb Collaboration].
LHCb-CONF-2011-002

6. **"Prompt charm production in pp collisions at $\sqrt{s} = 7$ TeV"**
R. Aaij *et al.* [LHCb Collaboration].
LHCb-CONF-2010-013

7. **"SimpleTools: Handy command line tools for ntuple manipulation and analysis"**
C. Fitzpatrick
LHCb-INT-2009-029

8. **"Roadmap for selected key measurements of LHCb"**
R. Aaij *et al.* [The LHCb Collaboration].
arXiv:0912.4179 [hep-ex]

9. **"First observation of $B_s \to J/\psi f_0(980)$ decays"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1102.0206 [hep-ex]
Phys. Lett. **B698**, 115-122 (2011)

10. **"Prompt $\mathbf{K_S^0}$ production in pp collisions at sqrt(s)=0.9 TeV"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1008.3105 [hep-ex]
Phys. Lett. **B693**, 69-80 (2010)

11. **"Measurement of $\sigma(pp \to b\bar{b}X)$ at $\sqrt{s} = 7$ TeV in the forward region"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1009.2731 [hep-ex]
Phys. Lett. **B694**, 209-216 (2010)

12. **"First observation of $B_s \to D_{s2}^{*+} X \mu\nu$ decays"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1102.0348 [hep-ex]
Phys. Lett. **B698**, 14-20 (2011)

13. **"Measurement of J/psi production in pp collisions at sqrt(s)=7 TeV"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1103.0423 [hep-ex]
Eur. Phys. J. **C71**, 1645 (2011)

14. **"Search for the rare decays $\mathbf{B_s^0 \to \mu\mu}$ and $\mathbf{B \to \mu\mu''}$**
R. Aaij *et al.* [the LHCb Collaboration].
arXiv:1103.2465 [hep-ex]
Phys. Lett. **B699**, 330-340 (2011)

15. **"Determination of f_s/f_d for 7 TeV pp collisions and a measurement of the branching fraction of the decay $B_d \to D^- K^+$"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1106.4435 [hep-ex]

16. **"Measurement of V^0 production ratios in pp collisions at $\sqrt{s} = 0.9$ and 7 TeV"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1107.0882 [hep-ex]
JHEP **1108**, 034 (2011)

17. **"Measurement of the inclusive phi cross-section in pp collisions at sqrt(s) = 7 TeV"**
R. Aaij, *et al.* [LHCb Collaboration].
arXiv:1107.3935 [hep-ex]

Referees

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