Preface

As a member of the ATLAS Collaboration I was involved in various projects, some of which are included in this thesis. The full list is included here in reverse chronological order, for completeness.

- **Measurements of four-jet differential cross sections from $\sqrt{s} = 8$ TeV proton-proton collisions using the ATLAS experiment.** I led most of the aspects of the analysis. See Chap. 4 of this thesis. I was the main author and contact editor of the paper, published in 2015 in the Journal of High Energy Physics, issue 12, pp. 1–76.
- **Limits on metastable gluinos from ATLAS SUSY searches at 8 TeV.** I produced all the results corresponding to the multi-jet analysis (one of the two searches included in the note). Published in 2014 as the ATLAS note ATLAS-CONF-2014-037.
- **Performance of $E_{\mathrm{T}}^{\mathrm{miss}}$ at high luminosity.** I performed a new parametrisation of the $E_{\mathrm{T}}^{\mathrm{miss}}$ in the high luminosity scenario, which has been used in the upgrade physics analyses since 2013. Part of the results were published in the ATLAS note ATL-PHYS-PUB-2013-009.
- **Search for new phenomena in final states with large jet multiplicities and missing transverse momentum at $\sqrt{s} = 8$ TeV proton-proton collisions using the ATLAS experiment.** I was responsible for the stream of the analysis, described in Chap. 3 of this thesis. I performed the optimisation of the analysis strategy, calculated the signal and background contributions and uncertainties, and processed the data. See Chap. 3 of this thesis. Published in 2013 in the Journal of High Energy Physics, issue 10, pp. 1–50.
- **Searches for supersymmetry at the high luminosity LHC with the ATLAS detector.** I produced all the results for the strong production section. Published in 2012 as the ATLAS note ATL-PHYS-PUB-2013-002.

New York, USA — Dr. Mireia Crispín Ortuzar

http://www.springer.com/978-3-319-43460-5

High Jet Multiplicity Physics at the LHC

Crispin Ortuzar, M.

2016, XXII, 177 p. 95 illus., 62 illus. in color., Hardcover
ISBN: 978-3-319-43460-5