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Contact information: caterina.doglioni@hep.lu.se

Foreword

Due to the large nature of experimental collaborations in particle physics, each publication relies on the results of a very large number of individual researchers and technicians. For this reason, the author list of each of the public documents by the ATLAS experiment includes all members of the collaboration, in alphabetical order.

Public material released by the Collaboration and its members comprises:

- PhD theses;
- Conference notes, containing the documentation of results for analyses to be shown at international conferences (called *preliminary*);
- Conference proceedings (where required by the conference organizers), summarizing a contribution at an international conference;
- Papers, where journals allowing Open Access are privileged in accordance with the CERN Open Access policy, and e-prints are available on the arXiv.

Conference notes, conference proceedings and papers are reviewed by a selected group of members of the collaboration not involved in the analysis, assigned to each publication according to their expertise, called *Editorial Board*. Once the Editorial Board review is complete, the results and their documentation are reviewed by the entire collaboration before being submitted to a journal.

I have co-authored 506 papers as a member of the ATLAS Collaboration, published in peer-review journals. The following list of papers where I made a significant contribution has been selected according to the relevance for this proposal. They concern performance and measurements of hadronic physics, searches for new phenomena and dark matter.

The total number of citations for all publications included in this list is 35063, excluding self-citations. The database used is SPIRES (INSPIRE). A detailed breakdown of citations can be found at this link. In this document, I list the most relevant publications including those co-authored within the ATLAS collaboration.

Peer-reviewed articles and public documents

Individual publications: reviews and whitepapers

1. **(2015) "Dark Matter Benchmark Models for Early LHC Run-2 Searches: Report of the ATLAS/CMS Dark Matter Forum"** D. Abercrombie *et al.* [The ATLAS/CMS Dark Matter Forum].
   Link to HEP entry. arXiv:1507.00966 [hep-ex]
   Number of InspireHEP citations: 15.
   This document is the final report of the ATLAS-CMS Dark Matter Forum, a forum organized by the ATLAS and CMS collaborations with the participation of experts on theories of Dark Matter. It contains the set of Dark Matter signal benchmarks for the design of the early LHC Run-2 searches, together with studies of the parameter space of these models and a repository of generator implementations. This report also addresses how to apply the Effective Field Theory formalism for collider searches and present the results of such interpretations. I have been one of the five organizers and editors of this paper. Even though this is not a peer-reviewed publication, we have organized for 10 prominent senior scientists of the field to participate in an internal peer-review of this document prior to publication on the arXiv and CERN servers.
2. **(2014) " Simplified Models for Dark Matter and Missing Energy Searches at the LHC"**
   Abdallah J. , Ashkenazi A., Boveia A., Busoni G., De Simone A., Doglioni C., Efrati A.,*et al.*.
   Link to HEP entry. arXiv:1409.2893 [hep-ph], Submitted to Physics of the Dark Universe.
   Number of InspireHEP citations: 55.
   This paper reviews the state of searches and benchmarks for Dark Matter at the LHC, and points to search strategies and benchmark choices for the upcoming LHC run. I have authored 'Section VII - Searching for the mediators', which highlights the importance of searching directly for the particles mediating the interaction between Dark Matter particles and Standard Model particles, in particular with low-mass dijet searches, as a complement to existing searches both at colliders and in Direct Detection.
3. *** (2014) " Simplified Models for Dark Matter Searches at the LHC"**
   Abdallah J. , Araujo H., Arbey, A, Ashenazi, A, Belyaev A, Berger, J, Boehm C, Boveia A.,*et al.*.
   Link to HEP entry. arXiv:14506.03116 [hep-ph], Published in Phys. Dark Univ. **9**-10, 8
   Number of InspireHEP citations: 18.

This paper includes a series of contributions from the discussion held at the DM@LHC conference in Oxford in September 2014, about Dark Matter benchmark models and experimental strategies for the upcoming LHC run. I have contributed to the discussion and to the review of this document as an organizer of the DM@LHC conference.

Summary of publications as a member of the ATLAS Collaboration

1. **(2016) "Search for new phenomena in the dijet mass and angular distribution from pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector"** G. Aad *et al.* [ATLAS Collaboration].
   Link to HEP entry. arXiv:1512.01530 [hep-ex] Phys.Let. B754 (2016) 302-322
   Number of InspireHEP citations: 47.
   The dijet invariant mass spectrum and angular distributions are studied in search of new resonant phenomena. This is the first search publication for the LHC, for the 13 TeV run. In absence of any signal, the world's strongest constraints are set on a number of benchmark models. I have contributed to many aspects of the analysis, focused both on the performance of the highest energy jets used for this search and on the preparation of the inputs for the analysis. I have supervised the work of the Lund PhD student who was the contact person for this analysis.
2. **(2014) "Search for new phenomena in the dijet mass distribution using pp collision data at $\sqrt{s} = 8$ TeV with the ATLAS detector"** G. Aad *et al.* [ATLAS Collaboration].
   Link to HEP entry. arXiv:1407.1376 [hep-ex] Phys.Rev. D91 (2015) 052007
   Number of InspireHEP citations: 209.
   The dijet invariant mass spectrum is studied in search of new resonant phenomena. In absence of any signal, constraints are set on a number of benchmark models. Starting from 2012, I have been one of the leading authors of this search, contributing to every aspect of the analysis. I have been appointed contact analyst for two analysis iterations with the 8 TeV dataset, leading to editorship of the two public notes ATLAS-CONF-2012-088 and ATLAS-CONF-2012-148. I have been the contact editor for the full-dataset paper above, published in PRD.
3. **(2015) "Search for New Phenomena in Dijet Angular Distributions in Proton-Proton Collisions at $\sqrt{s} = 8$ TeV Measured with the ATLAS Detector"** G. Aad *et al.* [ATLAS Collaboration].
   Link to HEP entry. arXiv:1504.00357 [hep-ex] Phys. Rev. Lett. **1**14 (2015) 22, 221802
   Number of InspireHEP citations: 11.
   The dijet angular distributions are studied in search of new non-resonant phenomena. In absence of any signal, this paper sets constraints on the mass scale of new interactions. I have provided he software and datasets necessary for this search, and supervised the PhD student at Lund University who had been appointed contact of this analysis and led this search, which has now been published in PRL.
4. **(2015) "'Search for high-mass diboson resonances with boson-tagged jets in proton-proton collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector"** G. Aad *et al.* [ATLAS Collaboration].
   Link to HEP entry. arXiv:1506.00962 [hep-ex] JHEP 1512 (2015) 055
   Number of INSPIRE citations: 189
   The invariant mass spectrum of boson-jets (hadronically decaying bosons, whose decay products are reconstructed as a single jet) is studied for deviations from the Standard Model prediction. This analysis is one of the few that found an excess in the LHC Run-1, making it very interesting from the phenomenology point of view as well as from detector performance. I have been involved in the design and analysis code for this search, and I was the supervisor of the PhD student who was the contact person of this analysis.
5. **(2014) "Jet energy measurement and its systematic uncertainty in proton–proton collisions at $\sqrt{s} = 7$ TeV with the ATLAS detector"** G. Aad *et al.* [ATLAS Collaboration].
   Link to HEP entry. arXiv:1406.0076 [hep-ex], Published in Eur. Phys. J. C (2015) 75:17.
   Number of Google Scholar citations: 257.
   This paper documents the calibration and performance of hadronic jets in the ATLAS detector for the full 2011 LHC dataset. I have been the leading author of the analysis and editor of the public note ATLAS-CONF-2013-004 detailing the calibration and uncertainty of the jet energy scale (Sections 6, 13 and 21 in this paper). This analysis has allowed to understand the baseline ATLAS jet energy scale with a precision of better than 2%, starting from the very first pre-data taking estimate of a roughly 6% systematic uncertainty. A full treatment of correlations between the jet energy scale uncertainty components is provided in light of measurement combinations and parton distribution function fits. I have supervised and provided software to one of the students who has established the jet energy scale for jets originated by different partons (Section 19 and 20).
6. **(2013) "Jet energy measurement with the ATLAS detector in proton-proton collisions at $\sqrt{s} = 7$**

TeV" G. Aad *et al.* [ATLAS Collaboration].
Link to HEP entry. arXiv:1112.6426 [hep-ex], Published in Eur. Phys. J. C **73**, 2304 (2013).
Number of INSPIRE citations: 734.
This paper documents the calibration and performance of hadronic jets in the ATLAS detector for the full 2010 LHC dataset, and established the techniques that have been used for the ATLAS detector since. I have been the leading author of the analysis and editor of the two public notes ATLAS-CONF-2011-032, ATLAS-CONF-2010-056 detailing the very first calibration and uncertainty of the jet energy scale and its improvements (Sections 8 and 9 in this paper). I have supervised the work on the jet energy scale uncertainties for jets originated from different parton flavours (Sections 18 and 20).

7. **(2013) "ATLAS search for new phenomena in dijet mass and angular distributions using pp collisions at $\sqrt{s} = 7$ TeV"** G. Aad *et al.* [ATLAS Collaboration].
Link to HEP entry. arXiv:1210.1718 [hep-ex] Published in JHEP **1301**, 029 (2013).
Number of INSPIRE citations: 169
The dijet invariant mass spectrum and angular distributions are studied in search of new physics processes. No excesses above the backgrounds are found, and constraints are set on a variety of resonant and non-resonant new phenomena. Throughout the course of 2012 I have contributed to the jet performance studies for this analysis, as a member of a task force of external experts called to review the analysis.

ATLAS Conference notes, as editor

1. **"Jet energy scale uncertainty correlations between ATLAS and CMS"**
[ATLAS Collaboration] (November 2014) ATLAS-PUB-2014-020
2. **"Search for New Phenomena in the Dijet Mass Distribution updated using 13 fb^{-1} of pp Collisions at $\sqrt{s} = 8$ TeV collected by the ATLAS Detector"**
[ATLAS Collaboration] (November 2012) ATLAS-CONF-2012-148
3. **"Search for New Phenomena in the Dijet Mass Distribution using 5.8 fb^{-1} of pp Collisions at $\sqrt{s} = 8$ TeV collected by the ATLAS Detector"**
[ATLAS Collaboration] ATLAS-CONF-2012-088
4. **"Jet energy scale and its systematic uncertainty in proton-proton collisions at $\sqrt{s}$=7 TeV with ATLAS 2011 data"**
[ATLAS Collaboration] (January 2013) ATLAS-CONF-2013-004
5. **"Jet energy scale and its systematic uncertainty in proton-proton collisions at $\sqrt{s}$=7 TeV in ATLAS 2010 data"**
[ATLAS Collaboration] ATLAS-CONF-2011-032
6. **"Jet energy scale and its systematic uncertainty for jets produced in proton-proton collisions at $\sqrt{s}$=7 TeV and measured with the ATLAS detector"**
[ATLAS Collaboration] ATLAS-CONF-2010-056

ATLAS papers for analyses coordinated as convenor of the Jets and Dark Matter group

As the convenor of the Jet+X subgroup, I have followed and reviewed the following analyses closely, helping the teams with advice, hands-on studies and editing of the public documents wherever needed.

1. **(2014) 'Search for new phenomena in final states with an energetic jet and large missing transverse momentum in pp collisions at $\sqrt{s}$ =8 TeV with the ATLAS detector"** G. Aad *et al.* [ATLAS Collaboration].
Link to HEP entry. arXiv:1502.01518 [hep-ex], Published inEur. Phys. J. C 75, no. 7, 299 (2015), Erratum: [Eur. Phys. J. C 75, no. 9, 408 (2015)].
In the most sensitive search for WIMP dark matter, the missing transverse momentum distribution is analysed for excesses due to invisible particles escaping detection, such as dark matter candidates, gravity-mediating particles and supersymmetric particles.
2. **(2014) "Search for new phenomena in events with a photon and missing transverse momentum in pp collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector"**
G. Aad *et al.* [ATLAS Collaboration].
Link to HEP entry. arXiv:1411.1559 [hep-ex], Published in Phys. Rev. D. 91, 012008 (2015) *This search looks for excesses of missing transverse momentum in association with energetic photons, a possible signature of Dark Matter particles. No signs of new phenomena are found above the background, and limits are set on various models including Dark Matter particles.*
3. **(2014) "Search for dark matter in events with heavy quarks and missing transverse momentum in pp collisions with the ATLAS detector"**

G. Aad *et al.* [ATLAS Collaboration].
Link to HEP entry Eur. Phys. J. C. 75 (2015) 92
Number of INSPIRE citations: 56.
Dark Matter coupling to heavy quarks is a possible explanation the galactic center excess of gamma rays. This analysis looks for excesses of missing transverse momentum in association with heavy quarks as a possible signature of Dark Matter particles. No signs of new phenomena are found above the background, and limits are set on Dark Matter models.

4. **(2014) "Search for dark matter in events with a hadronically decaying W or Z boson and missing transverse momentum in pp collisions at $\sqrt{s}$=8 TeV with the ATLAS detector"** G. Aad *et al.* [ATLAS Collaboration].
Link to HEP entry. arXiv:1309.4017 [hep-ex], Published in Phys. Rev. Lett. **112**, 041802 (2014).
Number of INSPIRE citations: 136
This search for Dark Matter exploits jet substructure techniques to identify events where the Dark Matter particles are produced in association with W bosons. This allows to achieve the best sensitivity so far to certain types of Dark Matter. No excesses have been observed, and constraints on Dark Matter particles are set.

Published papers reviewed as ATLAS Editorial Board chair/member

1. **"Measurement of three-jet production cross-sections in pp collisions at 7 TeV centre-of-mass energy using the ATLAS detector"**
G. Aad et al. [ATLAS Collaboration], Link to HEP entry, arXiv:1411.1855 [hep-ex]
Eur. Phys. J. C **75** (2015) 5, 228
2. **"Measurement of kT splitting scales in W->lv events at $\sqrt{s}$=7 TeV with the ATLAS detector"**
G. Aad *et al.* [ATLAS Collaboration]. Link to HEP entry, arXiv:1302.1415 [hep-ex]
Eur. Phys. J. C **73**, 2432 (2013)
3. **"Measurement of the mass difference between top and anti-top quarks in pp collisions at $\sqrt{s} = 7$ TeV using the ATLAS detector"**
G. Aad *et al.* [ATLAS Collaboration]. Link to HEP entry, arXiv:1310.6527 [hep-ex] Phys. Lett. B **728**, 363 (2014)

Peer-reviewed conference proceedings

1. **"Dark matter searches at ATLAS, Run1 results and Run2 potential"**
C. Doglioni Moriond proceedings **2015** Link to proceedings
2. **"Searches for Heavy Hadronic Resonances with the ATLAS and CMS detectors at the LHC"**
C. Doglioni and F. Santanastasio. PoS LHCPP **2013**, 015 (2013). Link to HEP entry
3. **"Jet energy scale uncertainty and resolution in the ATLAS experiment"**
C. Doglioni. PoS EPS-**HEP2011**, 286 (2011). Link to HEP entry
4. **"Design of the Jet Performance Software for the ATLAS Experiment at LHC"** C. Doglioni, P. Francavilla, P. Loch, K. Perez and R. Vitillo. (2011) Link to HEP entry

Books: PhD Thesis (November 2011)

"Measurement of the inclusive jet cross section with the ATLAS detector at the Large Hadron Collider" Published in Springer Theses Series, 2012 (1500 chapter downloads)
Link to HEP entry, Link to Springer website