

Physics

Physics Analysis Topics

Current Topics:

- Search for Higgs Boson Pair Production in the 4b final state
- Search for Boosted $H \rightarrow b\bar{b}$ plus jet production
- Search for new heavy particles decaying to boosted $V+H(b\bar{b})$
- VBF Higgs($b\bar{b}$)
- [Search for Heavy Higgs with Associated b Production](#)
- Search for Higgs $\rightarrow a\bar{a} \rightarrow 4b$
- Search for Higgs $\rightarrow a\bar{a} \rightarrow \gamma\gamma\gamma\gamma$
- [Quirks](#)

Previous Run 1 Activities:

- SM Higgs $W/Z+H(b\bar{b})$
- SM Higgs $Z+\gamma$
- SM Measurements of color flow, jet charge and charged multiplicity in hadronic events
- Full hadronic $t\bar{t}$ production
- Search for scalar top pair production with 1 lepton + jet + MET
- [New physics search with b-jet and Missing Et](#)
- RPV Multijet SUSY Search
- [RPV SUSY Displaced Vertex Analysis](#)
- [Stopped Gluinos](#)
- [Lepton Jets](#)

Physics Performance Studies and Trigger

- [Jet+MET+bTag Analysis Group](#)
- [Jet re-clustering and close-by jets task force](#)
- Flavor tagging working group activities
- Pixel reconstruction and simulation (ionization model, radiation damage, clustering...)
- [b-jet trigger](#)

Physics Analysis Information Summary (Run II)

Current Physics Analyses

Topic	Physics WG	SLAC contact	SLAC people	Collaborating groups	Note/pubs	Public link	Internal link	Status	Last update
Boosted $H(\rightarrow b\bar{b})+jet$	Exotics	Michael Kagan	M. Kagan, R. Teixeira De Lima	Chicago, LBL, SMU, Geneva				Analysis jsut starting	Sep/2017
Quark and gluon tagging with Jet Images in ATLAS	Jet/EtMiss	F. Rubbo (editor)	F. Rubbo, A. Schwartzman	LBLN, Stanford	ATL-PHYS-PUB-2017-017	PUB note	ATL-COM-PHYS-2017-1000	Done	August 2017
Quark versus Gluon Jet Tagging Using Charged Particle Multiplicity with the ATLAS Detector	Jet/EtMiss	F. Rubbo (editor)	F. Rubbo	LBLN		PUB note	pub note draft	Done	August 2017
Search for $H \rightarrow a\bar{a} \rightarrow \gamma\gamma\gamma\gamma$	Higgs (HBSM)	F. Rubbo	A. Cukierman , F. Rubbo, A. Schwartzman				Analysis Twiki supporting note	Unblinding in progress.	August 2017
RNN based b-tagging	Flavour Tag	M. Kagan	M. Kagan, Z. Jiang, L. Tompkins	UC Irvine, Yale	ATL-PHYS-PUB-2017-003	PUB Note		Done	Mar 2017
Search for Heavy Higgs decaying to $b\bar{b}$ -bar, produced in association with a b-quark	Higgs (Hbb /HBSM)	T. Barklow (a nalysis contact)	T. Barklow, D. Su	Cracow, Belgrade, Uppsala		General intro	Analysis Twiki	Run 2 analysis aimed for summer 2017 conferences, Ed board started	Mar 2017

Jet Mass Reconstruction	Jet/EtMiss	B. Nachman (editor)	B. Nachman	Oxford, Heidelberg, Innsbruck		CONF note	support note	Done	July 2016
Constituent pileup mitigation	Jet/EtMiss	F. Rubbo	F. Rubbo A. Cukierman A. Schwartzman	Harvard, Chicago	ATLAS-CONF-2017-065	CONF note	supporting note (ATL-COM-PHYS-2016-430)	Done	August 2017
Forward pileup jets	Jet/EtMiss	F. Rubbo (editor)	F. Rubbo A. Schwartzman	Michigan (previously Columbia)		paper	supporting note paper draft	Done	August 2017
Search for VBF H→bb at 13 TeV	Higgs	F. Rubbo	F. Rubbo F. Kukuck A. Schwartzman	INFN Genova, Stanford, Michigan			Analysis Twiki supporting note	Unblinding in progress.	August 2017
Search for di-Higgs production in the 4b final state from pp collisions at s = 13 TeV with the ATLAS detector	Exotics / BSM Higgs	M. Kagan (analysis contact)	M. Kagan Q. Zeng A. Schwartzman	UCL, Amherst, Chicago, Harvard, SMU	ATLAS-CONF-2016-049 (ICH EP/2016) PRD 94, 052002 , arXiv: 1606.04782 (2015 data)		Analysis Twiki Glance record for EXOT-2016-26 Support (boosted) note: ATL-COM-PHYS-2016-584	Full 2015+2016 unblinded, approvals and publication in progress	Sep 2017
Search for heavy resonances decaying to W or Z boson and a Higgs boson in the qq'bb final state @ 13 TeV	Exotics DBL / BSM Higgs	M. Kagan (analysis contact, editor)	M. Kagan Q. Zeng A. Schwartzman D. Su	Columbia, Chicago, Harvard, UCL	ATLAS-CONF-2016-083 (ICH EP/2016)		Analysis Twiki Glance Record for EXOT-2016-12 2017 Conf note: ATLAS-CONF-2017-018 Support note: ATL-COM-PHYS-2016-1480	Paper submitted	Sep 2017
Search for Direct Stop production at 13 TeV	SUSY	B. Nachman (analysis contact for 2015 analysis)	B. Nachman	CERN, Geneva, Wuppertal, Stockholm, Penn	ATLAS-CONF-2016-050 (ICH EP/2016) PRD 94,052009 , arXiv: 1606.03903 (2015 data pub)		Analysis Twiki 2015 data paper draft: ATL-COM-PHYS-2016-157 Support note: ATL-COM-PHYS-2015-1424	2015 analysis published. ICHEP/2016 conf note	Sep/2016
Boosted Higgs→bb tagging	B-tagging and Jet /ETmiss	M. Kagan (Analysis Contact, Editor)	M. Kagan Q. Zeng A. Schwartzman Z. Jiang L. Tompkins	Stanford, Chicago, Columbia, Amherst, Bonn, Harvard, CNRS, Yale, MSU, Edinburgh	Paper in preparation		Twiki Boost 2014 PUB: ATL-PHYS-PUB-2014-013 Boost 2015 PUB: ATL-PHYS-PUB-2015-035 Boost 2016 CONF: ATLAS-CONF-2016-039	PUB / CONF notes done Paper in preparation	July 2016
Advanced Higgs tagging techniques (Exclusive kT, and VR jets)	B-tagging and Jet /ETmiss	M. Kagan (Analysis Contact) Q. Zeng (Analysis Contact, Editor)	M. Kagan Q. Zeng A. Schwartzman	Irvine, U. Washington		PUB Note		done	June 2017

Jet substructure at 13 TeV with the early data	Jet/ETmiss	B. Nachman (analysis contact)	B. Nachman	University of Geneva		CONF note	Supporting Documentation : ATL-COM-PHYS-2015-514	Public for BOOST 2015	June 2015
Expected b-tagging performance in Run-II vs Run-I	B-tagging	G. Piacquadio	G. Piacquadio	CPPM,Freiburg,Iowa,UCL	Section contributing to IBL paper		https://svnweb.cern.ch/cern/wsvn/IBL/ibl_note.pdf	First draft ready	June 2015

Physics Analysis Information Summary (Run I)

Current Physics Analyses

Topic	Physics WG	SLAC contact	SLAC people	Collaborating groups	Note/pubs	Public link	Internal link	Status	Last update
ATLAS+CMS combination of final Run-I Higgs results	Higgs	G. Piacquadio	G. Piacquadio	Many, from ATLAS and CMS	In preparation			Work ongoing in LHG group	June 2015
B-tagging in dense environment note	B-tagging	G. Piacquadio	G. Piacquadio	SLAC,Wuppertal,UCL	In ATLAS final approval		https://cds.cern.ch/record/1981534?ln=en	End of ATLAS circulation	June 2015
Performance and Calibration of the JetFitterCharm Algorithm for c-Jet Identification	B-tagging	G. Piacquadio	G. Piacquadio	SLAC,Yale,UCL	ATL-PHYS-PUB-2015-001	https://atlas.web.cern.ch/Atlas/GROUPS/PHYSICS/PUBNOTES/ATL-PHYS-PUB-2015-001/		Public	January 2015
B-tagging at large eta	B-tagging	G. Piacquadio	G. Piacquadio	SLAC,Oklahoma,New York,UCL	ATLAS Large eta task force report (ATL-UPGRADE-INT-2015-001)	(not meant to become public)	https://cds.cern.ch/record/2020591	Done	June 2015
High-pt b-jet calibration using di-jet events	b-tagging	M. Kagan (Analysis contact)	M. Kagan	SLAC, Tokyo, Stockholm, Barcelona	in preparation		Twiki	note in preparation	
B-tagging validation in gluon->bb events	b-tagging	Z. Jiang M. Kagan (Analysis Contact, Editor) L. Tompkins (Analysis contact, Editor)	Z. Jiang M. Kagan B. Nachman Q. Zeng A. Schwartzman L. Tompkins	SLAC, Stanford	ATL-PHYS-PUB-2015-035	ATLAS-CONF-2016-002		done	Feb 2016
Track Jet Based b-tagging in Boosted and Resolved Topologies	B-tagging	M. Kagan (Analysis contact, Editor)	M. Kagan Q. Zeng A. Schwartzman Z. Jiang L. Tompkins	SLAC, Stanford, Columbia, Amherst, Nikhef, Tokyo, Stockholm, Barcelona, Bonn, Harvard, CNRS, Yale	ATL-PHYS-PUB-2014-013		Twiki	Calibration focused note in preparation	June 2015
MSSM Higgs decaying to b-quarks, produced in association with a b-quark	Higgs (HSG5)	C. Malone	Su Dong, C. Malone, G. Piacquadio, T. Barklow	SLAC	Caitlin Malone's Stanford Ph.D thesis: Stanford thesis repository CERN-THESIS-2015-080		Supporting document (draft): https://cds.cern.ch/record/1647407	Concluded with Stanford thesis	July 2015
Charged particle multiplicity inside jets	Standard Model	B. Nachman (analysis contact)	B. Nachman	SLAC	http://arxiv.org/abs/1602.00988				

Distinguishing Hadronic W and Z bosons	Jet/ETmiss	B. Nachman (analysis contact)	B. Nachman, A. Schwartzman	SLAC	http://arxiv.org/abs/1509.04939		Supporting documentation: ATL-COM-PHYS-2014-309 Paper draft: ATL-COM-PHYS-2015-035	Collaboration Review	June 2015
Jet Charge measurement	Standard Model	B. Nachman (analysis contact)	B. Nachman, A. Schwartzman, M. Swiatkowski	SLAC, Harvard	http://arxiv.org/abs/1509.05190		Supporting Documentation: ATL-COM-PHYS-2014-274 Paper Draft: ATL-COM-PHYS-2015-413	EB review	June 2015
Continuous b-tagging	B-tagging	G. Piacquadio	G. Piacquadio	SLAC, CERN, Genova, Nijmegen, Barcellona, AS	ATLAS-CONF-2014-XXX	CONF NOTE in preparation Supports the simultaneous calibration of multiple working points, including correct propagation of correlated uncertainties.	Supporting documentation: https://cds.cern.ch/record/1644430	EB review (will go in b-tag paper)	March 2014
Calibration of b-tagging efficiency in data	B-tagging	G. Piacquadio	G. Piacquadio	SLAC (+ CERN, Nijmegen, Berlin, Stockholm for CONF note)	ATLAS-CONF-2014-004	First ATLAS calibration with uncertainties as low as ~2%, based on novel likelihood method applied on di-lepton ttbar events.	Supporting documentation: https://cds.cern.ch/record/1538335 (methodology, 2012 EM jets) https://cds.cern.ch/record/1567111 (calibration on 2011 data) https://cds.cern.ch/record/1644568 (calibration on 2012 LC jets)	CONF Note APPROVED (will go in b-tag paper)	February 2014
RPV Multijet SUSY	SUSY	M. Swiatkowski	Max Swiatkowski, Ariel Schwartzman	SLAC, UChicago, Adelaide	Phys Rev D 91.112016	First limits on gluino-neutralino cascades in RPV models!	ATL-COM-PHYS-2014-073	Finished	Feb 2015
Pileup Jet Corrections	Jet/ETMiss	P. Nef	Pascal Nef, Ariel Schwartzman, Max Swiatkowski	Oxford, Lund, DESY	ATLAS-CONF-2012-064 for 2011 results, ATLAS-CONF-2013-084 for 2012 results	ATLAS-CONF-2013-083 , ATLAS-CONF-2012-064		More work in progress	July 2013
Pileup Jet Suppression	Jet/ETmiss	P. Nef	Pascal Nef, Ariel Schwartzman	SLAC	ATLAS-CONF-2014-018 ATL-PHYS-PUB-2014-001 (superseded)	ATLAS-CONF-2014-018 ATL-PHYS-PUB-2014-001 (superseded)		2014 CONF note approved	May 2014
JES Determination and Uncertainties	Jet/ETMiss	M. Swiatkowski	Max Swiatkowski, Ariel Schwartzman	many	ATLAS-CONF-2012-171	ATLAS-CONF-2012-171		Paper draft in progress	2015
Boosted Top Reconstruction	Jet/ETMiss	M. Swiatkowski	Max Swiatkowski, Ariel Schwartzman	SLAC, Columbia, Yale, UHeidelberg		ATLAS-CONF-2013-084		Paper forthcoming	August 2013
Jet Substructure Performance	Jet/ETMiss	M. Swiatkowski	Max Swiatkowski, Ariel Schwartzman	SLAC, UChicago, Columbia, Argonne, UCL, UHeidelberg	JHEP 09(2013)076	General paper on substructure performance and optimization using 7 TeV Run 1 data		Published	June 2013
b-tagging in boosted topologies	B-tagging and Jet/ETmiss	M. Kagan	M. Kagan, A. Schwartzman	SLAC, Buenos Aires, NIKEF, Columbia	none yet	none yet	https://indico.cern.ch/conferenceDisplay.py?confid=270837	work in progress	August 2013
Double B-Hadron Tagging	B-tagging	M. Swiatkowski	Max Swiatkowski, Ariel Schwartzman	University of Buenos Aires	ATLAS-CONF-2012-100	ATLAS-CONF-2012-100		2011 CONF Approved	June 2012
Quark-Gluon Tagging	Jet/ETMiss	M. Swiatkowski	Max Swiatkowski, Ariel Schwartzman	SLAC, LBNL, Harvard, Yale	EPJC August 2014 74:3023	http://arxiv.org/abs/1405.6583 , ATLAS-CONF-2012-138 First published paper on q/g tagging at a hadron collider!	ATLAS-COM-PHYS-2013-734	Finished (8 TeV + 13 TeV work ongoing)	May 2014
Q-Jets	Jet/ETMiss	M. Swiatkowski	Max Swiatkowski, Ben Nachman, Ariel Schwartzman	SLAC, University of Washington	ATLAS-CONF-2013-087	ATLAS-CONF-2013-087		CONF Note Approved for BOOST 2013	August 2013

Jet image processing analysis	Jet/ETmiss	M. Kagan, E. Strauss, J. Cogan	M. Kagan, E. Strauss, J. Cogan, A. Schwartzman	SLAC	ArXiv 1407.5675	http://arxiv.org/abs/1407.5675	http://indico.cern.ch/getFile.py/access?contribId=28&sessionId=6&resId=0&materialId=slides&confId=215704	Published on ArXiv	January 2015
Stopped Gluino Search	SUSY	J. Cogan	Andy Haas, Paul Jackson, Josh Cogan	SLAC	ATL-COM-PHYS-2011-166, ATL-COM-PHYS-2011-168, arXiv:1201.5595, 10. PhysRevD. 88.112003 arXiv: 1310.6584	https://confluence.slac.stanford.edu/display/Atlas/Stopped+Gluinos	https://twiki.cern.ch/twiki/bin/view/AtlasProtected/StoppedGluinos	submitted to EPJ (Jan /2012)	5/2/2012
Lepton-jets Search	Exotics	E. Strauss	Emanuel Strauss	SLAC, NYU, U. Alberta, U. Michigan	ATL-COM-PHYS-2012-799, CERN-PH-EP-2012-319	https://confluence.slac.stanford.edu/display/Atlas/Lepton+Jets	https://twiki.cern.ch/twiki/bin/view/AtlasProtected/Leptonjets	2011 analysis in EB review	8/1/2012
Boosted objects signatures using jet substructure	Exotics and Standard Model	A. Schwartzman	David. W. Miller, Ariel Schwartzman	SLAC, ANL, UCL, DESY, McGill, Toronto, Oxford, IFIC, UAN, Weizmann,	ATLAS-COM-CONF-2011-084		JetSubstructure TWiki	CONF Note approved on 5/17/11	5/17/11
QCD Event Shapes at High Q ²	Standard Model	A. Schwartzman	David. W. Miller, Ariel Schwartzman	SLAC	ATLAS-STD-2011-33-002		EventShapesAtHighQ2 TWiki	PRD draft in collab review	5/2/2012
SUSY searches with b + MET	SUSY	A. Schwartzman	Bart Butler, Per Hansson, Ariel Schwartzman, Dan Silverstein	SLAC, U Oklahoma, Tokyo, Sheffield, Liverpool, Freiburg, UT Arlington, CERN, Beunos Aires	ATL-COM-PHYS-2011-185 ATL-COM-PHYS-2011-1617 arxiv:1203.6193 ATL-COM-PHYS-2012-116		SUSYETmissBjet TWiki	submitted to PRD (Mar /2012)	5/2/2012
Higgs decaying to Z gamma	Higgs	T. Barklow	J. Cogan, B. Fulsom, T. Barklow	SLAC et al. (+22 groups)	ATL-COM-PHYS-2012-1795	http://arxiv.org/abs/1402.3051		In progress	2013/09 /05
Decay of X(3872) to J/psi gamma	BPhys	B. Fulsom	B. Fulsom	SLAC, Lancaster, Birmingham, Manchester				In development	2013/09 /05

Finished Papers, Conference notes, Theses

Title	Physics Topic	SLAC authors	Pubs/Notes/Thesis	Date
Operation of the ATLAS Trigger System in Run 2	Trigger	Andy Salnikov, Rainer Bartoldus, Catrin Bernius (ATLAS Collaboration mailing list)	arXiv:2007.12539 To be published in JINST	Aug 2020
Differentiating the Black-Box: Optimization with Local Generative Surrogates	ML/HEP	Michael Kagan	arXiv:2002.04632	Feb 2020
ATLAS b-jet identification performance and efficiency measurement with tt events in pp collisions at sqrt(s)=13 TeV	B-tagging	Michael Kagan Rafael Teixeira De Lima Nicole Hartman	Eur. Phys. J. C 79 (2019) 970	Nov 2019
Identification of boosted Higgs bosons decaying into b-quark pairs with the ATLAS detector at 13 TeV	Higgs / B-tagging	Michael Kagan	Eur. Phys. J. C 79 (2019) 836	October 2019
Higgs boson potential at colliders: status and perspectives	Higgs	Caterina Vernieri Michael Kagan Rafael Teixeira De Lima Michael Peskin	arXiv:1910.00012	Sep 2019
Continual Learning Via Neural Pruning	ML/HEP	Michael Kagan	arXiv:1903.04476	March 2019
A Roadmap for HEP Software and Computing R&D for the 2020s	ML/HEP	Michael Kagan	Comput Softw Big Sci (2019) 3, 7	March 2019
Search for pair production of Higgs bosons in the bb final state using proton-proton collisions at sqrt(s)=13 TeV with the ATLAS detector	Higgs	Michael Kagan	JHEP 01 (2019) 030	Jan 2019

Search for boosted resonances decaying to two b-quarks and produced in association with a jet at $\sqrt{s}=13$ TeV with the ATLAS detector	Higgs	Rafael Teixeira De Lima Michael Kagan	ATLAS-CONF-2018-052	Nov 2018
Machine Learning at the Energy and Intensity Frontier	ML/HEP	Michael Kagan Kazuhiro Terao	Nature 560, 41-48 (2018)	August 2018
Machine Learning in High Energy Physics Community White Paper	ML/HEP	Michael Kagan	arXiv:1807.02876	July 2018
Identification and rejection of pile-up jets at high pseudo rapidity with the ATLAS detector	Jet/Etmiss			
Search for heavy resonances decaying to a W or Z boson and a Higgs boson in the qqbb final state in pp collisions at $\sqrt{s}=13$ TeV with the ATLAS detector	Higgs / BSM	Michael Kagan Qi Zeng	Phys. Lett. B 774 (2017) 494	Nov 2017
Optimization and performance studies of the ATLAS b-tagging algorithms for the 2017-18 LHC run	B-tagging	Michael Kagan	ATL-PHYS-PUB-2017-013	July 2017
Search of new physics with boosted Higgs boson in hadronic final states with ATLAS detector	Ph.D thesis	Qi Zeng	Stanford University thesis	June /2017
Variable Radius, Exclusive-kt, and Center-of-Mass Subjet Reconstruction for Higgs($\rightarrow$ bb) Tagging in ATLAS	B-tag / Jets	Michael Kagan Qi Zeng Ariel Schwartzman	ATL-PHYS-PUB-2017-010	June 2017
Identification of Jets Containing b b-Hadrons with Recurrent Neural Networks at the ATLAS Experiment	B-tag	Zihao Jiang Michael Kagan Lauren Tompkins	ATL-PHYS-PUB-2017-003	Mar /2016
Learning to Pivot with Adversarial Networks	ML / systematics	Michael Kagan	Accepted at NIPS 2017 preprint: arXiv:1611.01046	Nov /2016
Investigating the Quantum Properties of Jets and the Search for a Supersymmetric Top Quark Partner with the ATLAS Detector	Ph.D thesis	Ben Nachman	https://cds.cern.ch/record/2204912	July /2016
Jet Images – Deep Learning Edition	ML / Jets	Luke de Oliveira Michael Kagan Ben Nachman Ariel Schwartzman	JHEP 07 (2016) 069 preprint: arXiv:1511.05190	July /2016
Boosted Higgs ($\rightarrow$ bb) Boson Identification with the ATLAS Detector at $\sqrt{s}=13$ TeV	B-tag / Jets	Michael Kagan Qi Zeng	ATLAS-CONF-2016-039	July /2016
Search for top squarks in final states with one isolated lepton, jets, and missing transverse momentum in $\sqrt{s} = 13$ TeV pp collisions with the ATLAS detector.	SUSY	Ben Nachman	Phys. Rev. D (2016) 052009 . Preprint: 1606.03903 [hep-ex]	June /2016
Search for pair production of Higgs bosons in the bbbb final state using proton-proton collisions at $s = 13$ TeV with the ATLAS detector	Exotics	Michael Kagan Qi Zeng	PRD 94 (2016) 052002 preprint: arXiv:1606.04782	June /216
Measurement of the charged particle multiplicity inside jets from $\sqrt{s} = 8$ TeV pp collisions with the ATLAS detector	Standard Model	Ben Nachman	Eur. Phys. J. C76(6), 1-23 (2016) . Preprint: 1602.00988 [hep-ex]	Feb /2016
Studies of b-tagging performance and jet substructure in a high pT $g\rightarrow$ bb rich sample of large-R jets from pp collisions at $\sqrt{s}=8$ TeV with the ATLAS detector	B-tag	Zihao Jiang Michael Kagan Lauren Tompkins	ATLAS-CONF-2016-002	Feb /2026
A new method to distinguish hadronically decaying boosted Z bosons from W bosons using the ATLAS detector	Jet/Etmiss	Ben Nachman	Eur. Phys. J. C76 (2016) 238 . Preprint: 1509.04939 [hep-ex]	Sept /2015
Measurement of jet charge in dijet events from $(s) = 8$ TeV pp collisions with the ATLAS detector	Standard Model	Ben Nachman	Phys. Rev. D93, 052003 (2016) . Preprint: 1509.05190 [hep-ex]	Sept /2015
Expected Performance of Boosted Higgs ($\rightarrow$ bb) Boson Identification with the ATLAS Detector at $\sqrt{s}=13$ TeV	B-tag / Jets	Michael Kagan Qi Zeng	ATL-PHYS-PUB-2015-035	Aug /2015
Measurement of colour flow with the jet pull angle in $t\bar{t}$ events using the ATLAS detector at $s = 8$ TeV	Top	Ben Nachman, Ariel Schwartzman, Max Swiatlowski	Phys. Lett. B (2015) 475 . arXiv:1506.05629	June /2015
A Search for Non-Standard Model Higgs Bosons Produced in Association with b-Quark at the ATLAS Experiment	Ph.D thesis	Caitlin Malone	Stanford thesis repository	June /2015

Search for di-Higgs production in the 4b final state from pp collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector	EXOTICS	M. Kagan	Eur. Phys. J. C (2015) 75: 412 arXiv:1506.00285	Sep /2015
Jet-Images: Computer Vision Inspired Techniques for Jet Tagging	Jet Tagging	M. Kagan, J. Cogan, E. Strauss, A. Schwartzman	JHEP02(2015)118, arXiv:1407.5675	Feb /2015
Search for massive supersymmetric particles decaying to many jets using the ATLAS detector in pp collisions at $\sqrt{s} = 8$ TeV	SUSY	Max Swiatlowski, Ariel Schwartzman	arXiv:1502.05686 , Phys Rev D 91.112016	Feb /2015
Performance and Calibration of the JetFitterCharm Algorithm for c-Jet Identification	b-tagging	Giacinto Piacquadio	ATL-PHYS-PUB-2015-001	Jan /2015
Search for the $b\bar{b}$ decay of the Standard Model Higgs boson in associated $(W/Z)H$ production with the ATLAS detector	Higgs	Giacinto Piacquadio	JHEP01(2015)069 http://arxiv.org/abs/1409.6212	Jan /2015
Flavor Tagging with Track Jets in Boosted Topologies with the ATLAS Detector	b-tagging	M. Kagan	ATL-PHYS-PUB-2014-013	Aug /2014
Search for top squark pair production in final states with one isolated lepton, jets, and missing transverse momentum in $\sqrt{s} = 8$ TeV pp collisions with the ATLAS detector	SUSY	Till Eifert, Philippe Grenier, Ben Nachman	JHEP 11 (2014) 118, arXiv:1407.0583	July /2014
Reconstruction and Modelling of Jet Pull with the ATLAS Detector	JetETmiss	Ben Nachman, Max Swiatlowski, Ariel Schwartzman	ATLAS-CONF-2013-086	July /2014
A neural network clustering algorithm for the ATLAS silicon pixel detector	Tracking	Tim Nelson, Giacinto Piacquadio	JINST 9 (2014) P09009 http://arxiv.org/abs/1406.7690	June /2014
Tagging and suppression of pileup jets with the ATLAS detector	JetETmiss	Pascal Nef, Ariel Schwartzman	ATLAS-CONF-2014-018	May /2014
Light-quark and gluon jet discrimination in pp collisions at $\sqrt{s} = 7$ TeV with the ATLAS detector	JetETMiss	Max Swiatlowski, Ariel Schwartzman	EPJC August 2014 74: 3023	May /2014
Search of out-of-time decays of stopped particles in the ATLAS detector	Ph.D thesis	Josh Cogan	Stanford thesis repository	Mar /2014
Calibration of b -tagging using dileptonic top pair events in a combinatorial likelihood approach with the ATLAS experiment	B-tagging	Giacinto Piacquadio	ATLAS-CONF-2014-004	Feb /2014
Machine learning in the search for Dark Matter with the ATLAS detector	Ph.D thesis	Dan Silverstein	Stanford thesis repository	Nov /2013
Search for long-lived stopped R-hadrons decaying out-of-time with pp collisions using the ATLAS detector	SUSY	Josh Cogan, Andy Haas, Paul Jackson	PhysRevD.88.112003, arXiv:1310.6584	Oct /2013
Jet Charge Studies with the ATLAS Detector Using $\sqrt{s} = 8$ TeV Proton-Proton Collision Data	JetETmiss	Ben Nachman, Max Swiatlowski, Ariel Schwartzman	ATLAS-CONF-2013-086	Aug /2013
Performance and Validation of Q-Jets at the ATLAS Detector in pp Collisions at $\sqrt{s} = 8$ TeV in 2012	JetETMiss	Max Swiatlowski, Ben Nachman, Ariel Schwartzman	ATLAS-CONF-2013-087	Aug /2013
Search for the $b\bar{b}$ decay of the Standard Model Higgs boson in associated W/ZH production with the ATLAS detector	Higgs	Giacinto Piacquadio	ATLAS-CONF-2013-079	Jul /2013
Performance of jet substructure techniques for large-R jets in proton-proton collisions at $\sqrt{s} = 7$ TeV using the ATLAS detector	JetETmiss	Max Swiatlowski, Ariel Schwartzman	JHEP 09(2013)076	Jun /2013
Search for direct top squark pair production in final states with one isolated lepton, jets, and missing transverse momentum in $\sqrt{s} = 8$ TeV pp collisions using 21.0 fb ⁻¹ of ATLAS data	SUSY	Till Eifert, Philippe Grenier, Ben Nachman	ATLAS-CONF-2013-037	Mar /2013
A search for prompt lepton-jets in pp collisions at $\sqrt{s} = 7$ TeV with the ATLAS detector	Exotic	Emanuel Strauss	Phys. Lett. B 719 (2013) 299-317	Feb /2013
Search for direct top squark pair production in final states with one isolated lepton, jets, and missing transverse momentum in $\sqrt{s} = 8$ TeV pp collisions using 13.0 fb ⁻¹ of ATLAS data	SUSY	Till Eifert, Philippe Grenier, Ben Nachman, Qi Zeng	ATLAS-CONF-2012-166	Dec /2012
Search for natural supersymmetry in hadronic final states of heavy flavors at ATLAS	Ph.D thesis	Bart Butler	CERN-THESIS-2012-203	Dec /2012
Search for direct top squark pair production in final states with one isolated lepton, jets, and missing transverse momentum in $\sqrt{s} = 7$ TeV pp collisions using 4.7 fb ⁻¹ of ATLAS data	SUSY	Till Eifert, Philippe Grenier	Phys. Rev. Lett. 109, 211803 (2012), http://arxiv.org/abs/1208.2590	Aug /2012
Search for decays of stopped, long-lived particles from 7 TeV pp collisions with the ATLAS detector	SUSY	Josh Cogan, Andy Haas, Paul Jackson	EPJC 4, Vol 72 (2012), 1965 DOI: 10.1140/epjc/s10052-012-1965-6	May /2012

Search for supersymmetry in pp collisions at $\sqrt{s} = 7$ TeV in final states with missing transverse momentum and b-jets with the ATLAS detector	SUSY	Bart Butler, Per Hansson, Ariel Schwartzman, Dan Silverstein	submitted to PRD arxiv:1203.6193	Mar /2012
Measurement of tt production in the all-hadronic channel in 4.7 fb^{-1} of pp collisions at $\sqrt{s} = 7$ TeV with the ATLAS detector	Top	Ignacio Aracena	ATLAS-CONF-2012-031	Mar /2012
Inclusive search for same-sign dilepton signatures in pp collisions at $\sqrt{s} = 7$ TeV with the ATLAS detector	Exotic	Michael Wilson	JHEP 10 (2011) 107 arxiv:1108.0366	Oct /2011
Search for displaced vertices arising from decays of new heavy particles in 7 TeV pp collisions at ATLAS	SUSY	Claus Horn	Phys.Lett. B707 (2012) 478-496 arXiv:1109.2242	Sep /2011
Measurement of Hadronic Event Shapes and Jet Substructure in Proton-Proton Collisions at 7.0 TeV Center-of-Mass Energy with the ATLAS Detector at the Large Hadron Collider (1 of the 5 ATLAS Ph.D thesis awards for 2011)	Ph.D thesis	David Miller	CERN-THESIS-2011-144 ; SLAC-R-974	Jun /2011
A Search for Lepton-Jets with Muons at ATLAS	Exotic	Emanuel Strauss, Andy Haas	ATLAS-CONF-2011-076	May /2011

Detailed records of Finished Physics Analyses

Topic	Physics WG	SLAC contact	SLAC people	Collaborating groups	Note /pubs	Public link	Internal link	Status	Last update
Performance of b-Jet Identification in the ATLAS Experiment	B-tagging	G. Piacquadio (leading author, later convener)	G. Piacquadio	Many many groups	2016 JINST 11 P04008	Run-1 b-tagging paper (contribution to algorithms, JetFitter, and calibration, b-jet calibration in ttbar events, back-ported to 2011 data analysis)			
Colorflow in the SM using top events	Top	B. Nachman (analysis contact), M. Swiatlowski	B. Nachman, A. Schwartzman, M. Swiatlowski	SLAC, Manchester, Harvard	arXiv: 1506.05629	CONF on pull reconstruction and performance published; Paper now published!	Supporting Documentation : ATL-COM-PHYS-2014-767 Paper Draft: ATL-COM-PHYS-2015-136		
Search for di-Higgs production in the 4b final state from pp collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector	Exotics / BSM Higgs	M. Kagan	M. Kagan	SLAC, UCL, Amherst, Columbia, Chicago, Nikhef		paper on arXiv	Analysis Twiki	public Submitted to EPJC	May 2015
Jet Pull Performance	Jet/ETmiss	B. Nachman	B. Nachman, A. Schwartzman, M. Swiatlowski	SLAC, Harvard	ATLAS-CONF-2014-048		Supporting Documentation : ATL-COM-PHYS-2014-047	Public	July 2014
SM Higgs to bb search	Higgs (HSG5)	G. Piacquadio (convener, previously contact editor)	G. Piacquadio	Many	Final paper: JH EP01 (2015) 069 ATLAS-CONF-2013-079 (2013)	Paper on arXiv https://cds.cern.ch/record/1563235 (old conf note)	2014 (for paper): ATL-COM-PHYS-2014-051 (general analysis note) 2013 (for conf note): ATL-COM-PHYS-2013-697 (b-tagging for VH) ATL-COM-PHYS-2013-465 (general analysis note)	Public	December 2014
Neural network based pixel clustering	Tracking /Pixel	G. Piacquadio (contact editor, Pixel Clusterization Task Force convener)	T. Nelson, G. Piacquadio	SLAC, CERN	JINST 9 (2014) P09009	A neural network clustering algorithm for the ATLAS silicon pixel detector, JINST 9 (2014) P09009 (http://arxiv.org/abs/1406.7690) Describes improvement in cluster resolution and ability to split shared clusters by using Neural Network pixel clustering (used in ATLAS reconstruction since beginning of 2012)	Supporting documentation: https://cds.cern.ch/record/1501928	Public	Mid 2014

Jet Charge (performance)	Jet/ETMiss	B. Nachman	Ben Nachman, Max Swiatlowski, Ariel Schwartzman	SLAC, Duke	ATLAS-CONF-2013-086	ATLAS-CONF-2013-086	https://cdsweb.cern.ch/record/1554095, https://cds.cern.ch/record/1566473	CONF Note approved for BOOST 2013 (August 2013)	August 2013
SUSY direct Stop search in 1 lepton + MET final state, full 2012 data	SUSY	T. Eifert	Till Eifert, Philippe Grenier, Ben Nachman	SLAC, Yale, Wuppertal, Geneva, NIKHEF	ATLAS-CONF-2013-037 ATL-COM-PHYS-2013-060 (support note)		https://twiki.cern.ch/twiki/bin/viewauth/AtlasProtected/DirectStop1Lepton		4/4/2013
Inclusive Same-sign Dilepton Analysis	Exotics	M. Wilson	M. Wilson	AS Taipei, Duke Univ., Heidelberg Univ., HU Berlin, Lund Univ., NIKHEF, SLAC, UC Berkeley, UC Irvine, Univ. of Manchester., Univ. of Pittsburgh	ATL-COM-PHYS-2010-1056 ATL-COM-PHYS-2011-107 arxiv: 1108.0366 JHEP 10 (2011) 107		InclusiveSameChargeDilepton TWiki	Published in JHEP Oct2011	5/2/2012

Physics Publication Editorial Board Services

Name	Pub/Note Title	Note number and doc link	Review Dates
F. Rubbo	A measurement of jet substructure variables in prompt J/psi events at ATLAS	Support note Paper draft	2017 (on-going)
B. Nachman	Stop 0-lepton	2015 Support note, 2016 Support note, CONF conversion	2015-2017
G. Piacquadio	SM Z+b analysis	JHEP10(2014)141 ATL-COM-PHYS-2014-037 ATL-COM-PHYS-2012-1504	2014
G. Piacquadio	Bs to mumu analysis	Phys. Lett. B713 (2012) 180-196 (previous 7 TeV publication)	2012-2014
M. Kagan	Dark Matter + Higgs->bb		since 2014 (on-going)
M. Kagan	Dark Matter + Heavy Flavor	EPJC 75 (2015) 92	2014
M. Kagan	Leptonic VH(->bb) Resonances		2016 (on-going)
E. Strauss	SM H -> mu mu	ATLAS Note	2012-2013
E. Strauss	Long-lived Neutral Particle Triggers	JINST 8 (2013) P07015	May 2013
T. Eifert	SUSY photon+L/b+MET		2012
T. Eifert	NMSSM neutral Higgs		2012
T. Eifert	SUSY photon+lep/b+MET		2013
T. Eifert	Exotics: Vector Like Quarks: Ht+X, Wb+X, Wt+X		2013
C. Young	<i>Search for Higgs -> WW > lnu jj (HIGG-2012-03)</i>	Paper	2012
C. Young	Diboson lnu jj resonance at 8 TeV (EXOT-2013-01)	Eur. Phys. J. C 75 (2015) 209	2013
C. Young	<i>Searches for heavy long-lived charged particles (SUSY-2013-22)</i>	JHEP01 (2015) 068	2013
C. Young	ATLAS Cavern Radiation Background (TECH-2014-01)		2014
C. Young	<i>Searches for metastable heavy charged particles with large ionization energy loss (SUSY-2014-09)</i>	Eur. Phys. J. C (2015) 75:407	2014
C. Young	RPV Multijet 1-lepton (SUSY-2016-11)		2016
C. Young	pp Ridge in Z events (CONF-HION-2016-09)		2016

B. Fulsom	psi(2S) vs. J/psi production cross section		2012
B. Fulsom	Search for new states decaying to Y(1S)pi pi		2013
P. Grenier	TR fake lepton for top final states	CONF-TOPQ-2014-09	2014
P. Grenier	Bd->K*mumu		2013

General Physics Utilities

- [Parton Level Analysis](#)
- [SLAC Common Ntuple Package](#)
- [Software Starters](#)