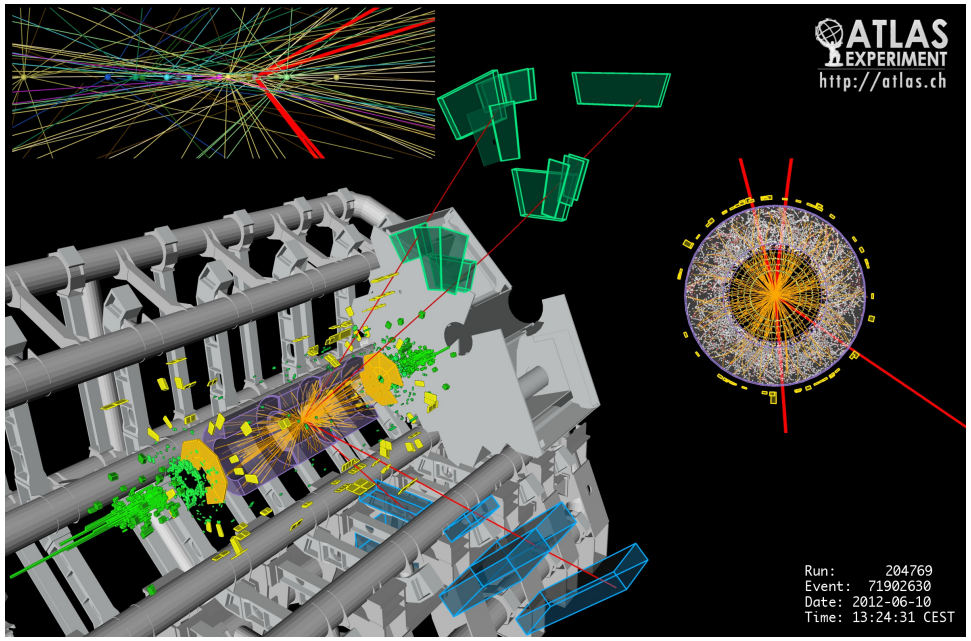
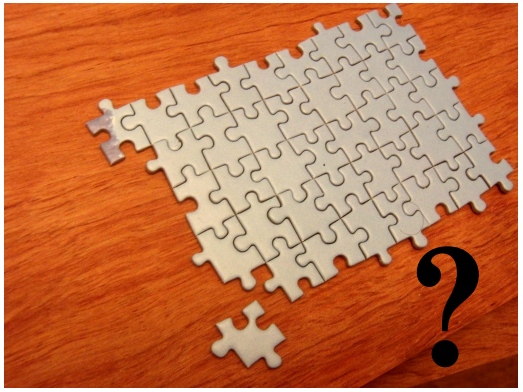
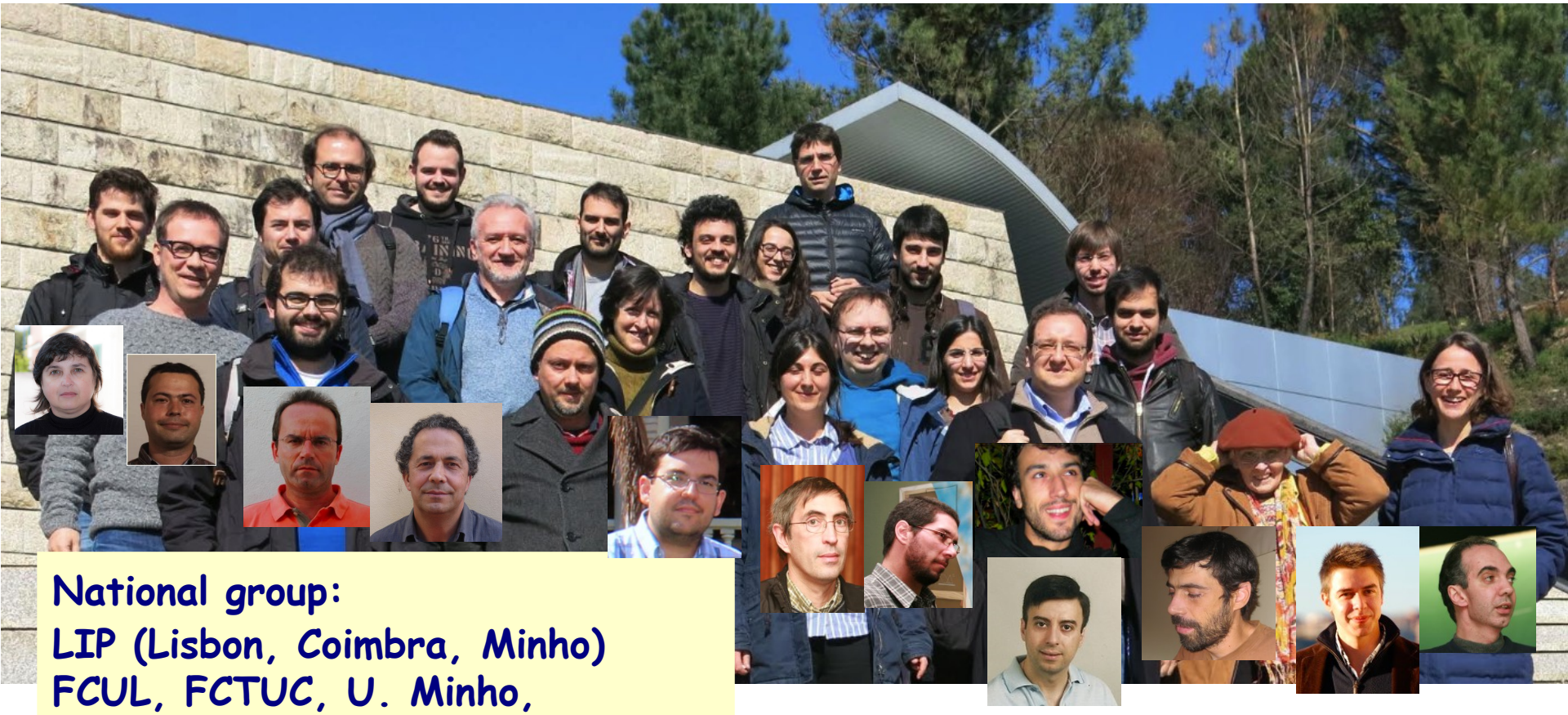




ATLAS Overview

The Portuguese ATLAS team

A equipa ATLAS Portuguesa

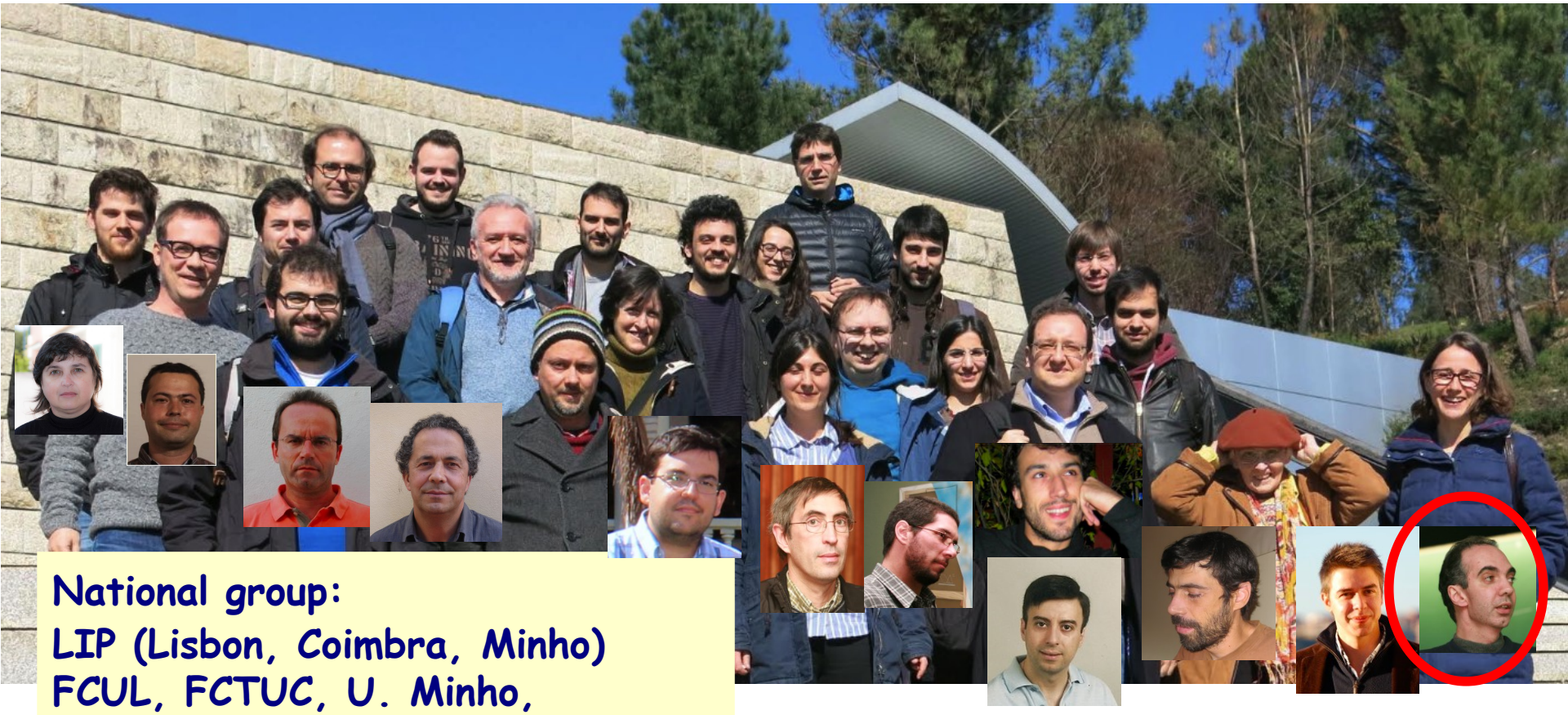


National group:

LIP (Lisbon, Coimbra, Minho)
FCUL, FCTUC, U. Minho,
IBEB, INESC, CEFITEC/UNL,
CFNUL, CFMC

AdI engineers training program

A equipa ATLAS Portuguesa



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CFNUL, CFMC

AdI engineers training program

José Silva (1968-2017)
With great sorrow we
said good bye to Zé Silva

Physics Activities (I)

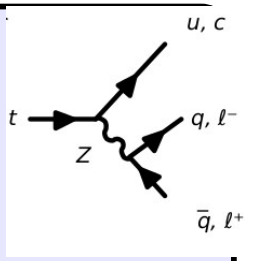
Higgs Boson Physics

P. Conde, R. Gonçalo

- Couplings of the Higgs to quarks
  - H→bb and ttH
  - Spin, CP properties in Hbb, ttH, HWW vertices

Top Quark Physics

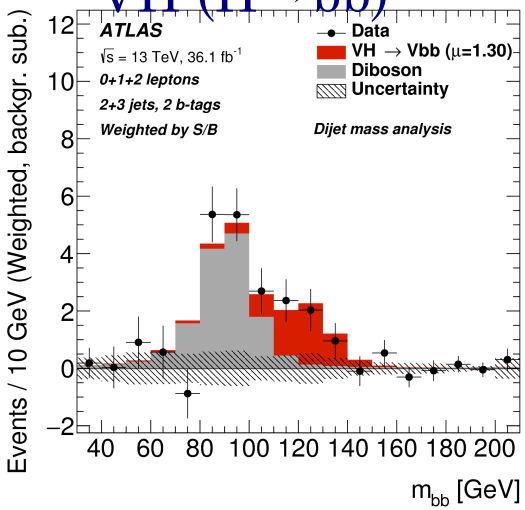
A. Onofre, F. Veloso



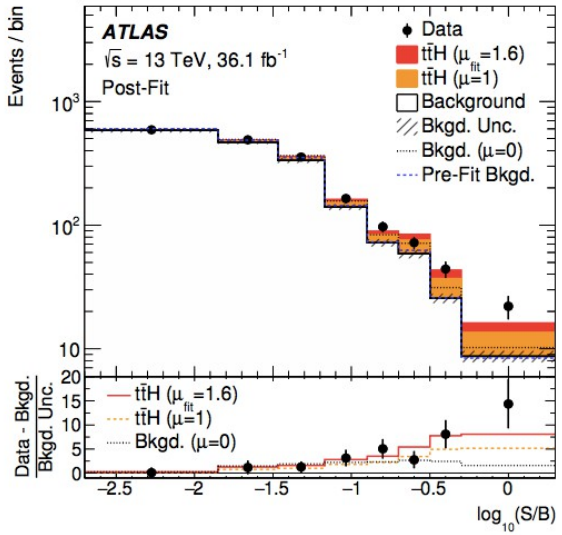
Rare top quark decays

- Measurement BR(t→Ws)
  - Develop s-tagging algorithm
- FCNC in top quark decays (t→Zq)

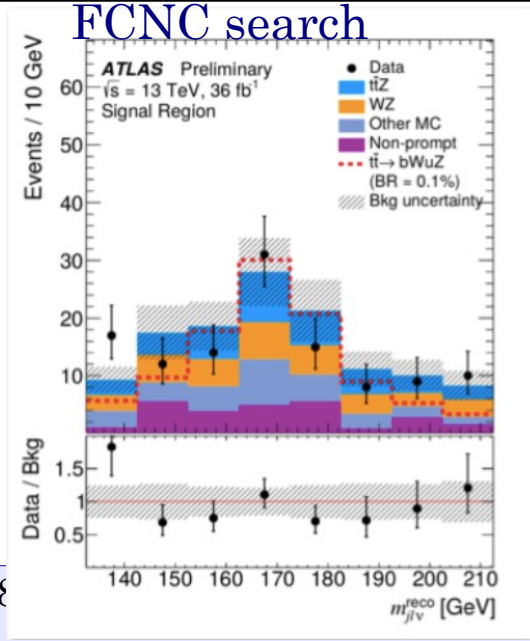
VH (H→bb)



ttH



FCNC search

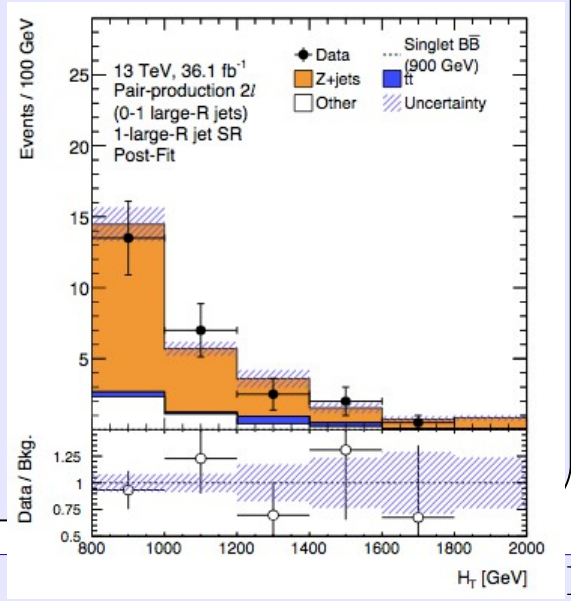


Physics Activities (II)

Exotics Physics Searches

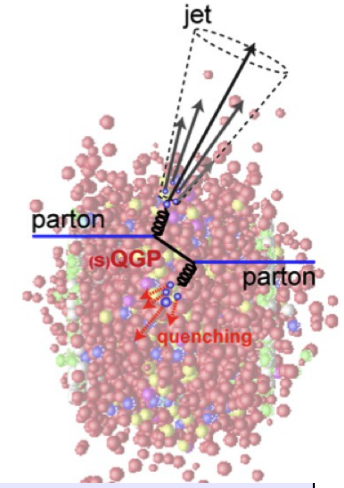
N. Castro

- Vector-like quarks
- Coordination and leading analysis
  - Zt/b+X topology
  - Monotop: t+missing E_T
- Search for tZ production via FCNC
- Contribute to analysis combination

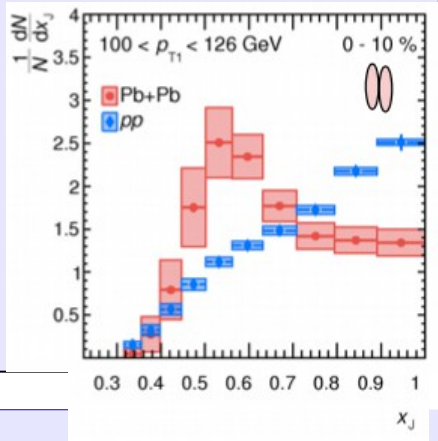


Heavy Ions Physics

H. Santos



- Jets to probe quark-gluon plasma
- Disentangle the energy loss mechanism
  - Di-b-jets asymmetry
- B-tagging performance for HI
- B-jets triggers
- Monitoring



Detector Responsibilities (I)

Jets trigger

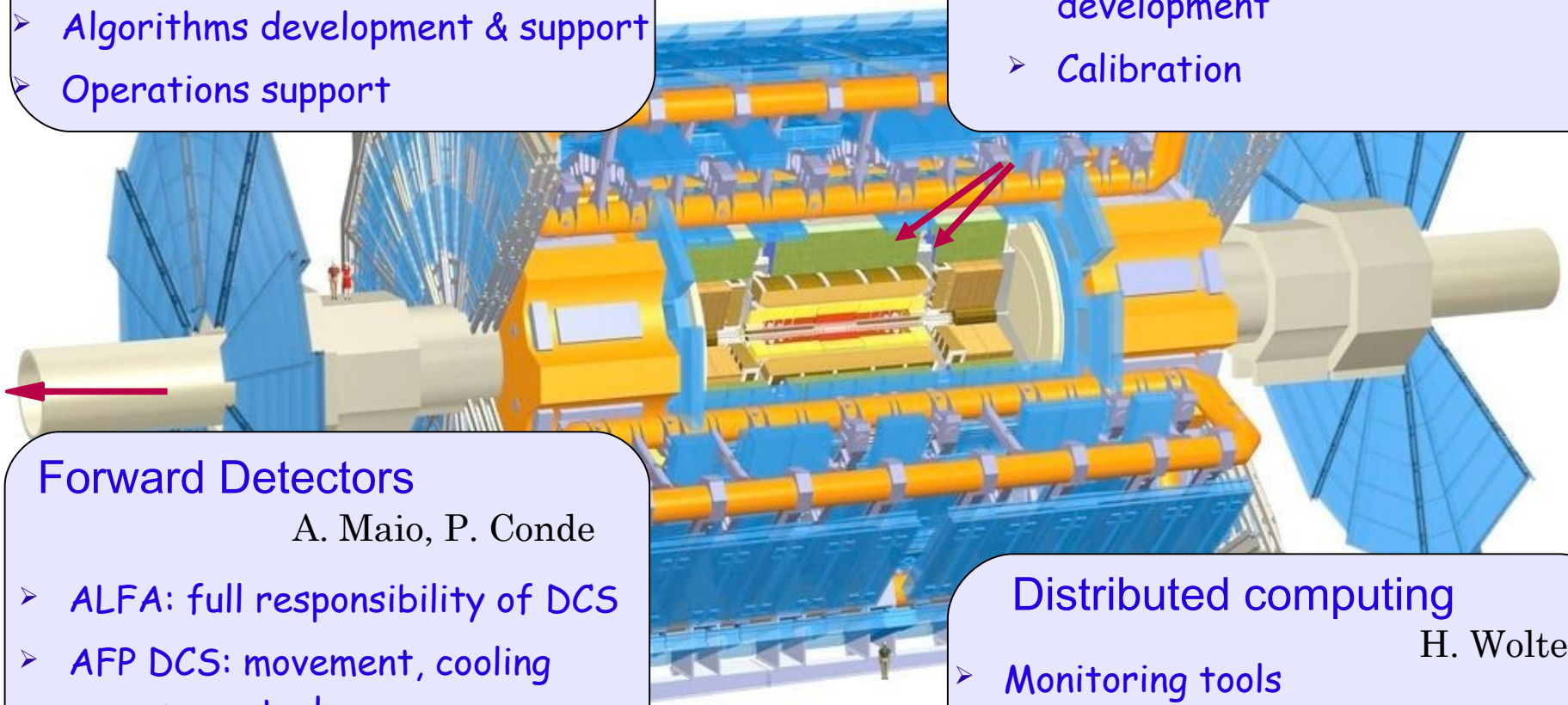
R. Gonçalo, P. Conde

- Algorithms development & support
- Operations support

TileCal

A. Gomes, A. Maio

- DCS coordination, support & development
- Calibration



Forward Detectors

A. Maio, P. Conde

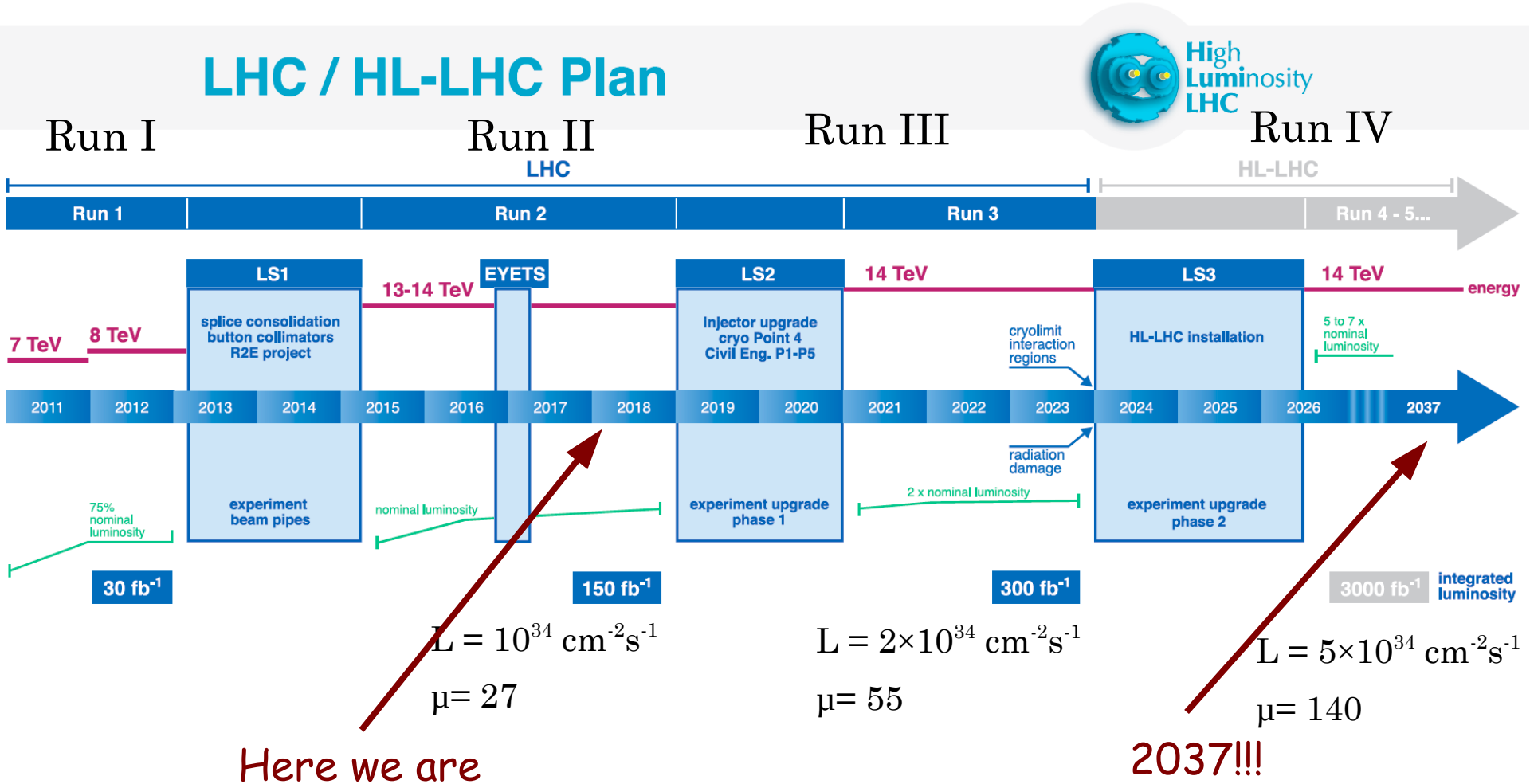
- ALFA: full responsibility of DCS
- AFP DCS: movement, cooling vacuum control
- Central exclusive di-jet triggers

Distributed computing

H. Wolters

- Monitoring tools
- Tier 2 infrastructure responsibility
- Iberian Cloud coordination

LHC and detector Upgrades schedule



Detector Upgrade Responsibilities

Jets trigger

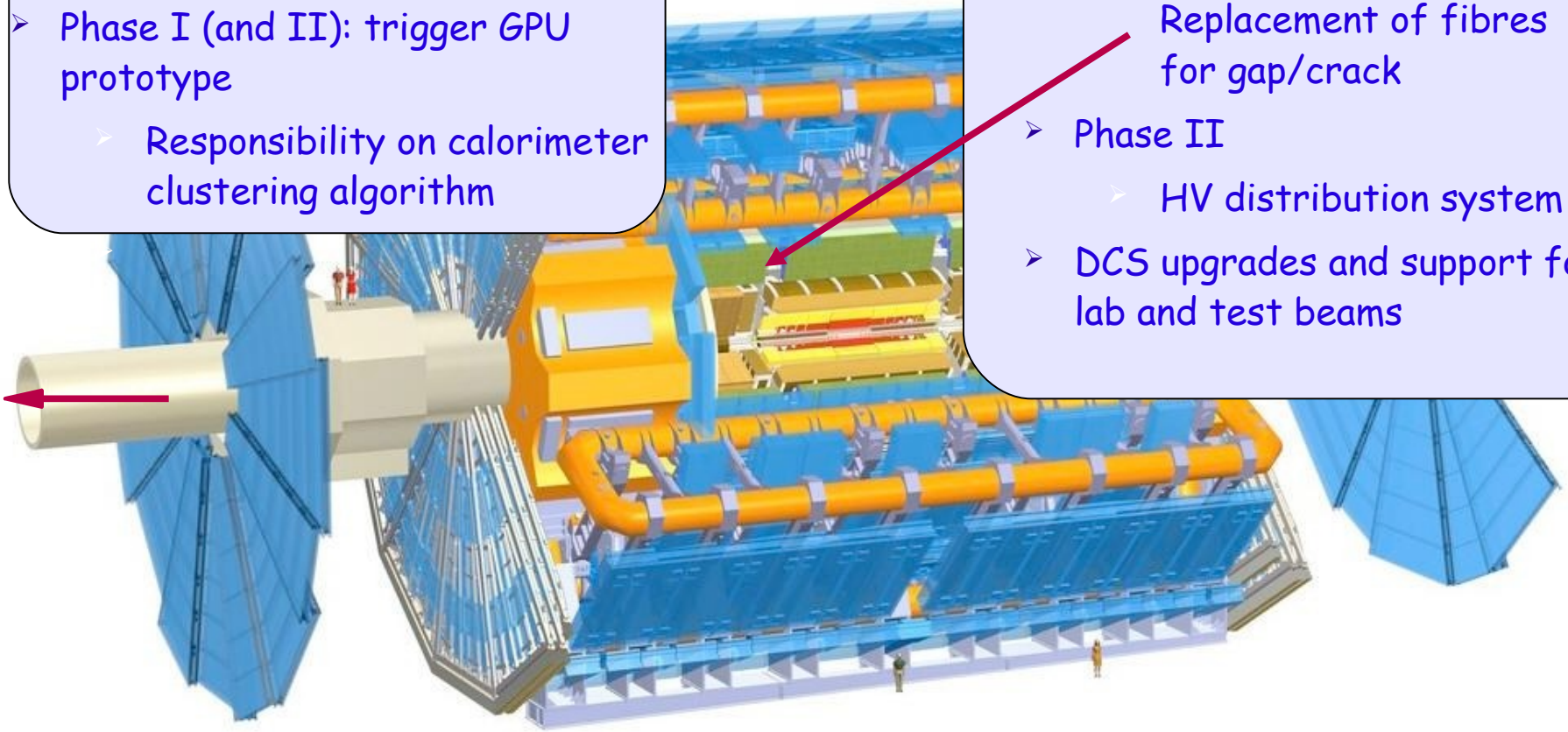
R. Gonçalo, P. Conde

- Phase I (and II): trigger GPU prototype
  - Responsibility on calorimeter clustering algorithm

TileCal

A. Gomes, A. Maio

- Phase I and II
  - Replacement of fibres for gap/crack
- Phase II
  - HV distribution system
- DCS upgrades and support for lab and test beams



Responsibility positions

- Coordination and responsibility positions in all areas
  - H. Wolters, coordinator of the Iberian Cloud.
  - H. Wolters, responsible for the Portuguese Federated Tier2 in Iberian Cloud Squad
  - F. Martins, TileCal DCS coordinator
  - L. Seabra, ALFA DCS responsible
  - N. Castro, theory contact for VLQ searches within the Exotics Working Group
  - N. Castro, contact person for the EFT of the Top Quark Working Group
  - Contact editors in theirs analysis:
    - J. P. Araque, N. Castro (monotop, tZ production via FCNC)
  - J. P. Araque, Monte Carlo manager for the Exotics Working Group.
  - N. Castro, J.P. Araque, members of the ATLAS Physics Office.
  - P. Conde, member of the Panel for Operation Task Sharing.
- Contributed to 12 Editorial Boards (3 as chair) of ATLAS publications

Agenda for today

- New HV distribution system for the TileCal Phase II Upgrade
  José Augusto
- Higgs Physics – Rute Pedro
- Top quark Physics – Bruno Galhardo
- Exotics Searches – Juanpe
- Jets in HI collisions – Rui Pereira

- Plus: scintillators and fibre activities in the LOMAC talk

Plus 10 posters with many details!!

Tile Calorimeter High Voltage Power Supplies – Upgrade Phase II

J. Augusto* (INESC-ID)

G. Evans* (IBEB)

A. Gomes*, L. Gurriana, F. Martins, J.G. Saraiva, L. Seabra (LIP)

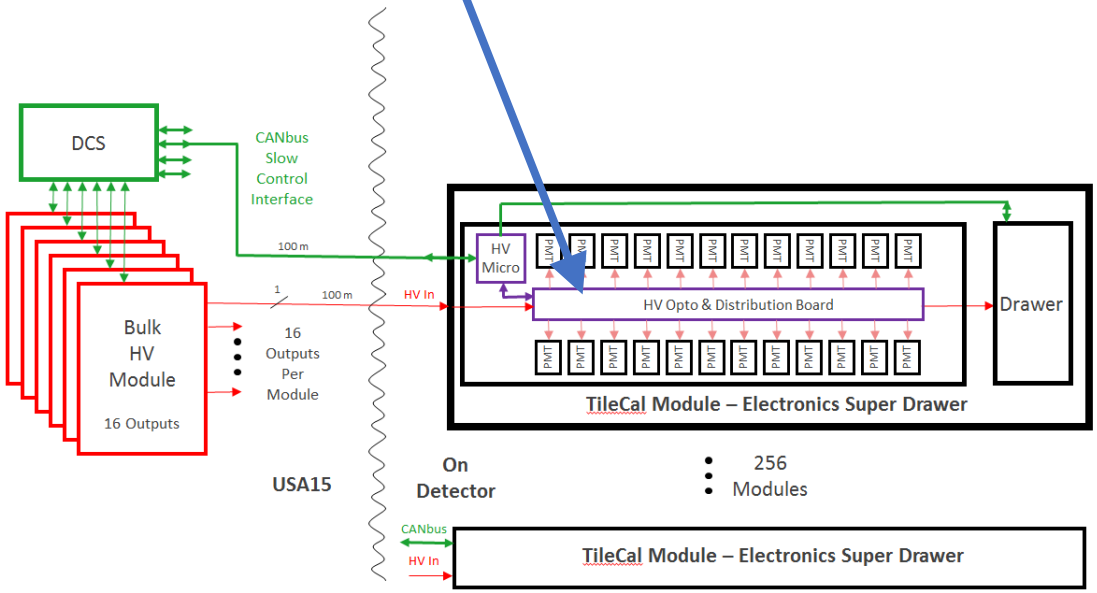
(*) and FCUL

Cables R&D: CABELTE, SA

Motivation for HVPS upgrade

TileCal HV regulation system is currently located inside the detector
Needs only 256 HV cables, 1 external HV enough to produce 48 HVs for the PMTs
Needs to be replaced for Phase II since

- it is old and it will become difficult to maintain
- not expected to survive to Phase II radiation



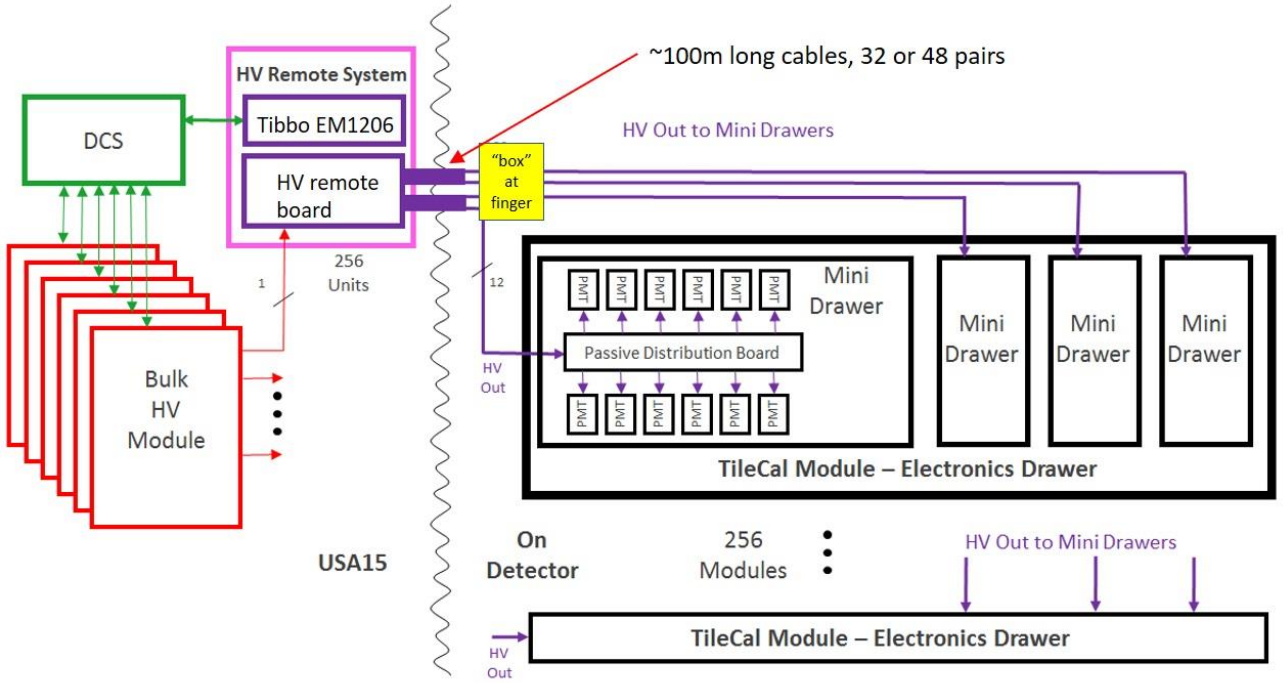
TileCal HV system

Specs and relevant parameters for the HV system:

HV needed for ~10 000 PMTs
HV < 900 V
Average applied HV has been ~750 V
Individual currents < 400 μA
HV stability < 0.5 V rms

Remote HVPS – baseline solution

- **Easy maintenance**
- **No radiation**
- **Always accessible**



Regulation and control system off detector at USA15

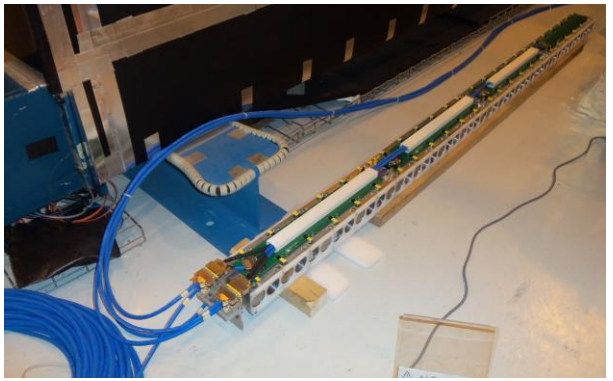
~20 000 wires
<- 100m long cables ->

HVbus (passive distribution board) in detector

Remote HVPS

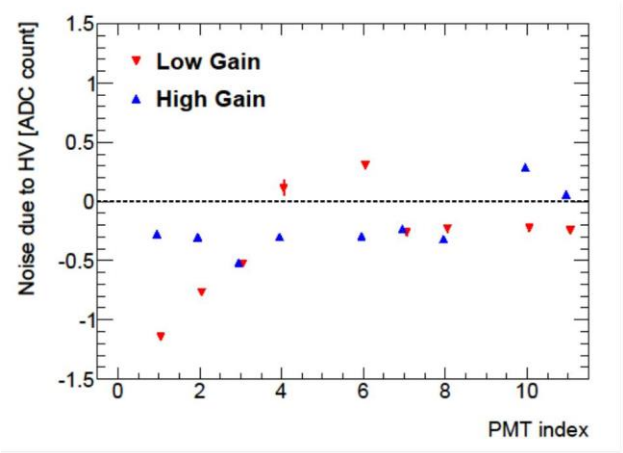
Prototypes based in existing boards tested in the lab and at testbeam

Crate with boards and long cables used in testbeam



HVbus boards mounted in a superdrawer

HV Noise contribution to the readout noise for the low and high readout gains

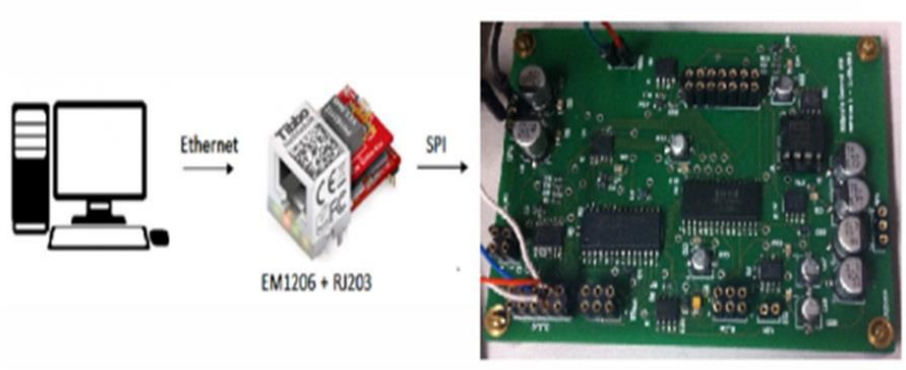


New prototypes being designed or in production in Portugal

Primary HVPS (currently in separate crate) will be installed also in the regulation boards crate

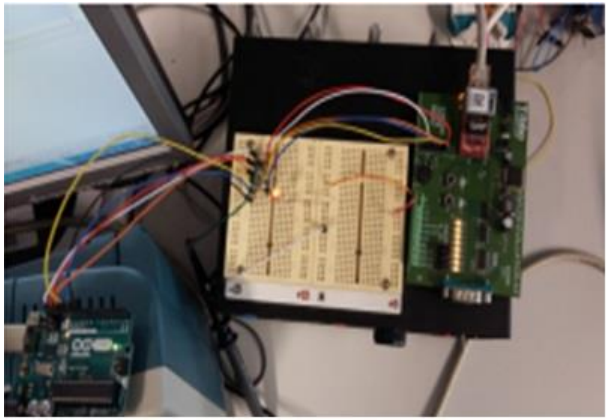
Test of control boards

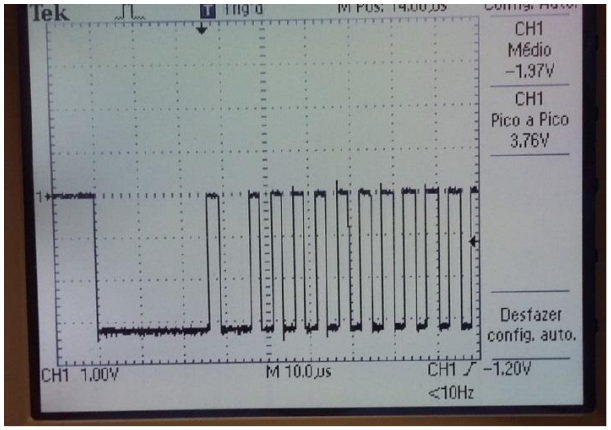
Control and monitoring using Ethernet
Communication with DACs and ADCs tested



Test boards produced at LIP
Some problems in first version,
Communication ok in second version

After the tests of control boards, first HVRemote prototype (with 24 ch) in production at Thermopista





SPI signal during communication at 200 kHz

HV cables

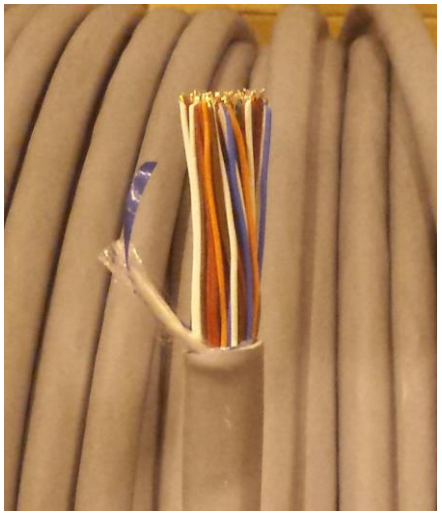
Cabling is the weak point of the HV remote system

~10 000 pairs of long (>100m) cables required to bring the HV to the detector

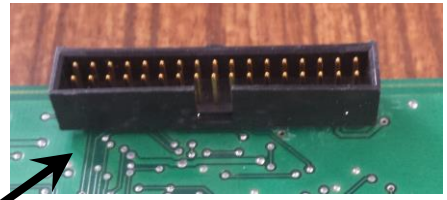
Volume available in the movable motorized chains that bring cables to the Extended Barrels (EB) is limited (cables for Long Barrel ok: 48 pairs of wires per cable, no motion)

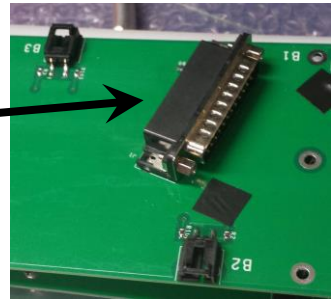
CABELTE developed a multicable with 32 pairs of wires suitable for TileCal HV in the EB, with a diameter of 16.5 mm. ATLAS Technical Coordination team informed that preliminary studies show that there is space available for this cable in the movable chains.

Cable prototype produced, now 250m at FCUL, 250m at CERN for tests



Connectors





Connectors – they exist but ...

HV < 900 V (typical ~750 V)
Connectors used in Tilecal boards not rated for HV but working fine for near 20 years!
Now need connectors for boards and connectors for 256 long multiconductor cables

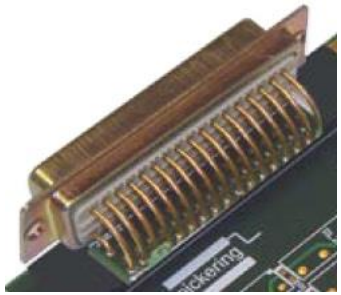
Connectors rated for HV? Bulky and expensive

Type of connector identified in 2017, with 26 connectors
Ok for HV, need 4 per cable

All flat connectors found until January were rated for lower voltages, only a few tested above 1000 V.

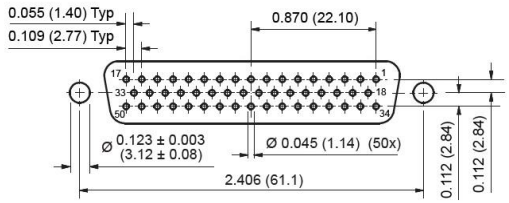
In January found promissing connectors:

D type connectors with 37 or 50 pins
Used for HV up to 1000V
Male and female available straight or at 90 degrees (perfect to mount in the boards)



50 pin connectors have 3 rows of pins, not easy to rout in the PCB

Connector Ratings:	
Maximum Current	5A
Maximum Voltage	1000V DC or AC



PCB Footprint of 50-Pin Straight Female HV Connector

Backshell still to solve: “box” to allow 2 connectors per cable (safety and robustness)

Production of HVPS

Production of the HVPS system

2018-19 Prototyping and tests

2020-23 Main production

- HV bus boards: 1024 boards + 100 (pre-production)
- HV remote boards: 256 boards + 25 (pre-prod)
- HV supplies (crates + primary HV): 16 crates + 2 (pre-prod)
- Cables system: 56 km of cables + connectors

Total core cost: 0.97 MEuros

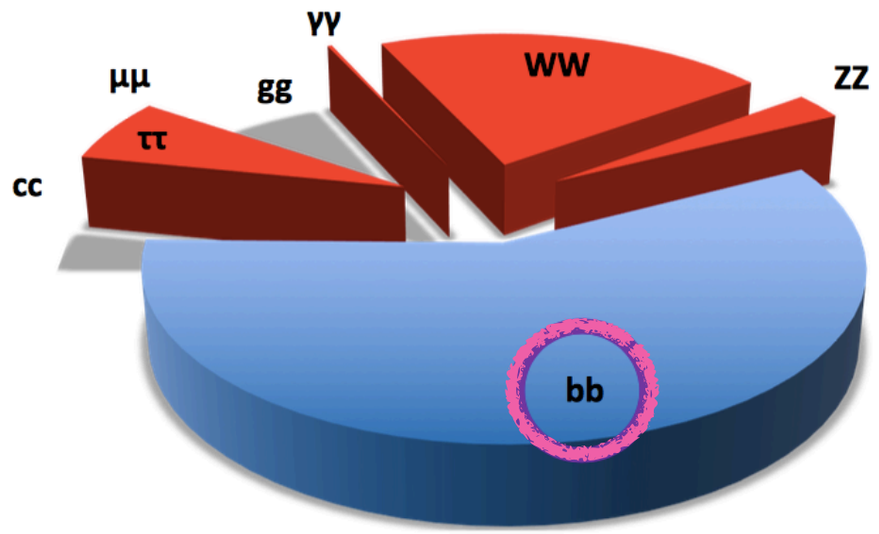
HIGGS PHYSICS

R. Pedro for the **ATLAS/LIP Higgs Group**

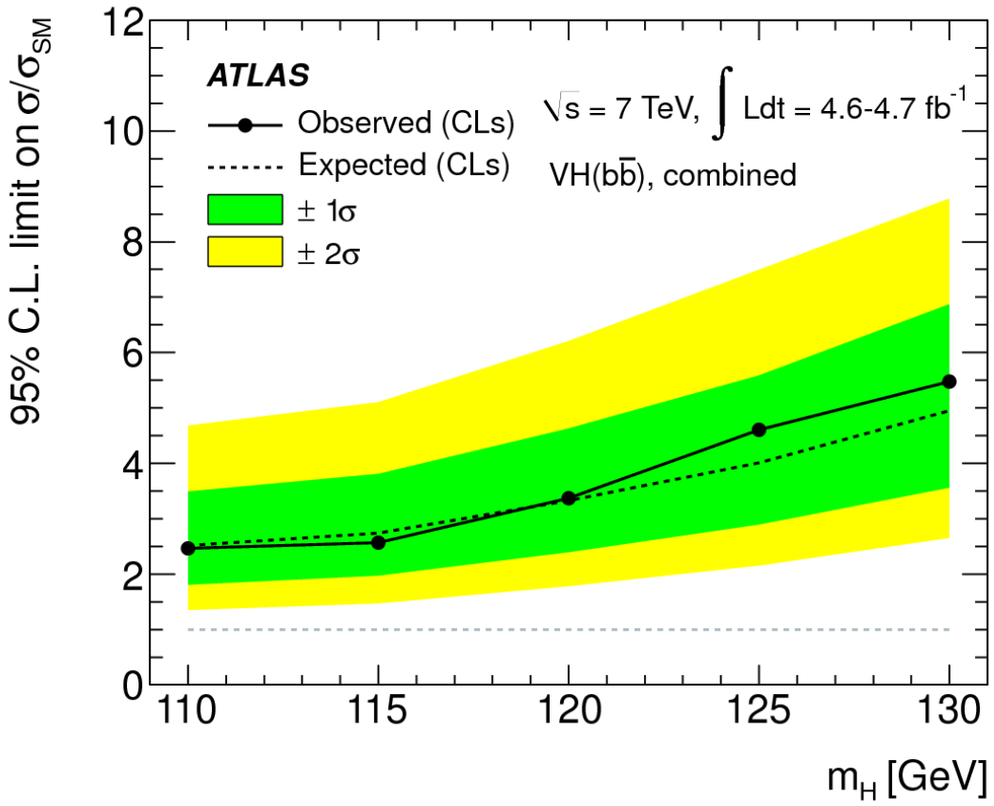
JORNADAS LIP . 16-18 FEBRUARY . ÉVORA

Higgs couplings to heavy quarks

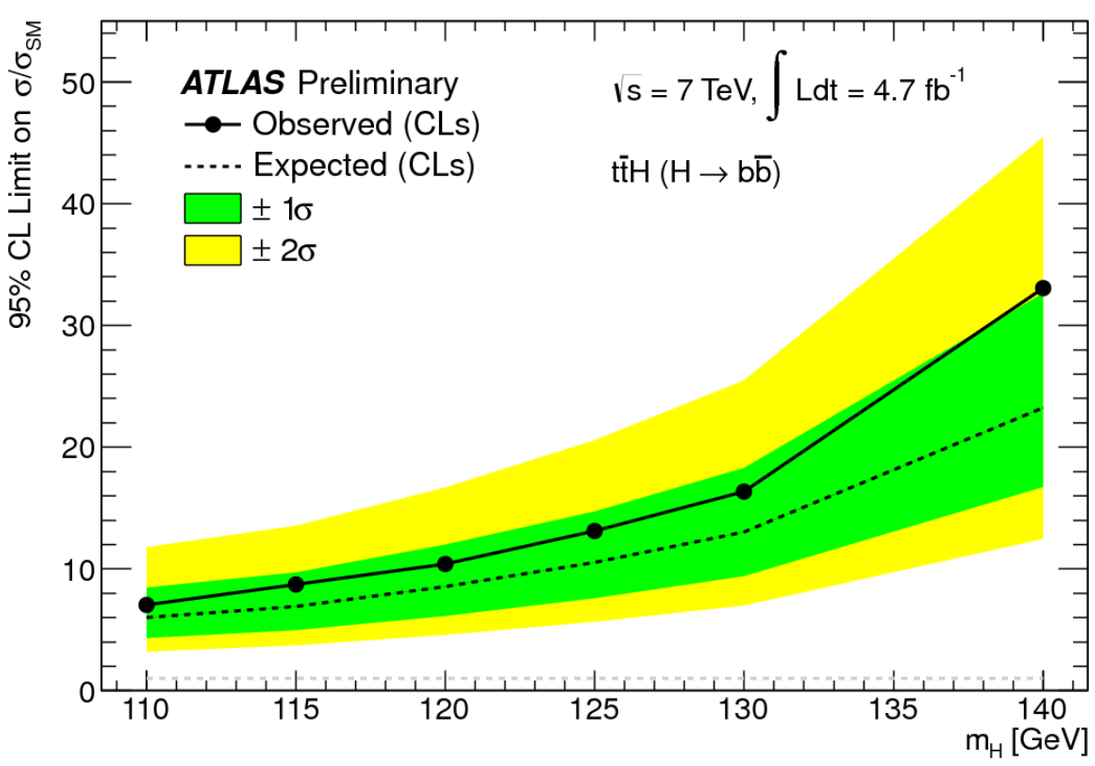
- **H→bb decay**
  - **dominant** in the SM: **58%**, m_H=125 GeV
  - **VH production** is the most sensitive channel
- **ttH production**
  - ttH is the **largest Yukawa coupling**
  - **H→bb** decay
- **Strong investment of the ATLAS/LIP group since 2009**



VH (H→bb) [arXiv:1207.0210v2]



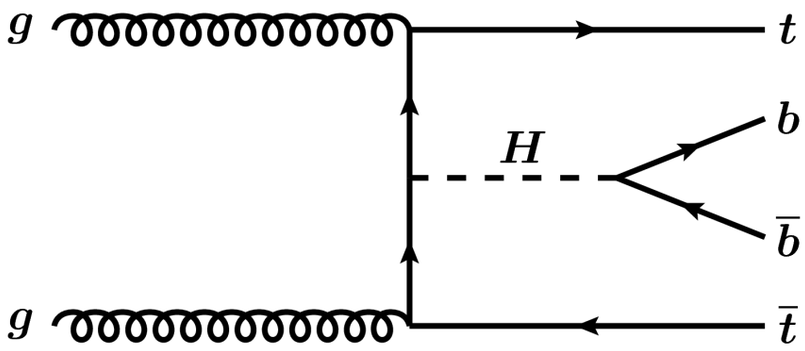
ttH (H→bb) [ATLAS-CONF-2012-135]



ttH(H→bb) analysis

[arXiv:1712.08895]

A. Onofre
R. Gonçalo
S. Amor
E. Gouveia

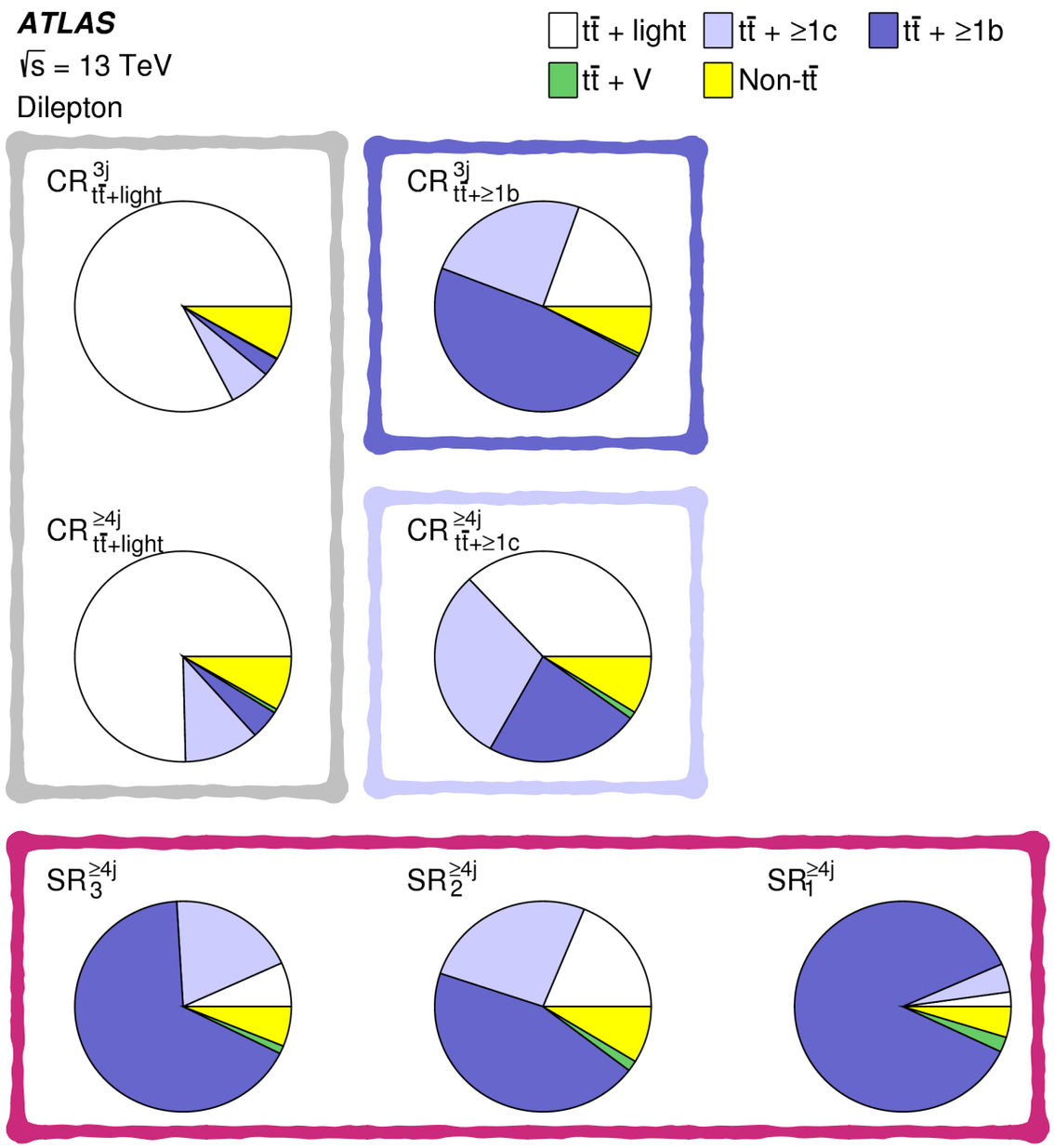


- **Direct measurement** of top Yukawa coupling

- **Di-lepton channel: ee, $\mu\mu$, eμ**
- Single lepton channel: e, μ

- **Control and signal regions**
  - Varying the b-tagging requirement
  - ttH **signal purity <5.4%**
  - Drive bkg normalisation and constrain uncertainties

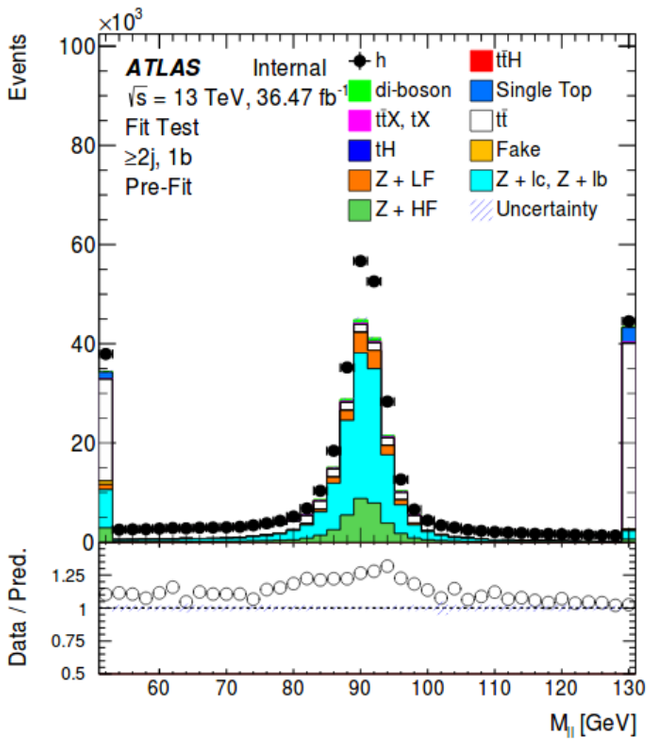
- **MVA methods** to enhance signal
- Simultaneous **profile likelihood fit** to all regions

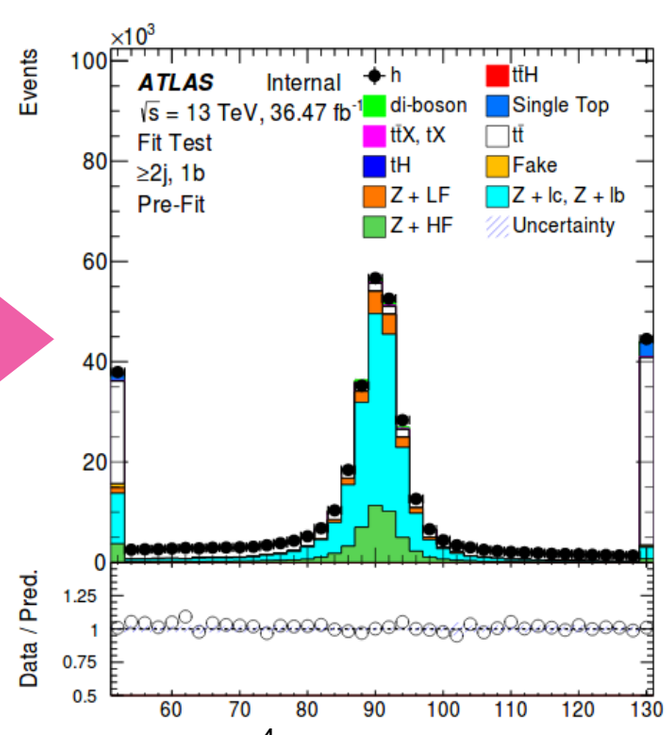


Modelling of Z+jets background

[arXiv:1712.08895]

- Z+jets **background important in di-lepton** channel
- Implemented control region of Z+jets
- Enriched samples of Z+jets **selecting Z mass peak**: $|m_{ll}-m_{Z}| < 8$ GeV
  - Play with b-tagging criteria and nº of jets -> **Sensitive to jets flavour**
  - **Normalise background using data**
  - Data **constrain of Z+jets uncertainty** to 35%

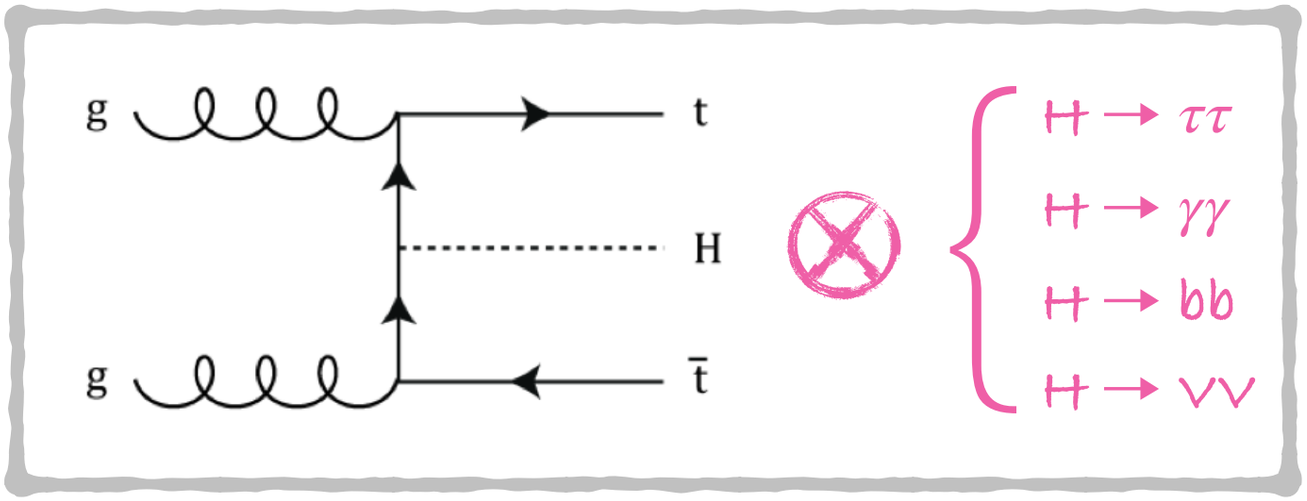


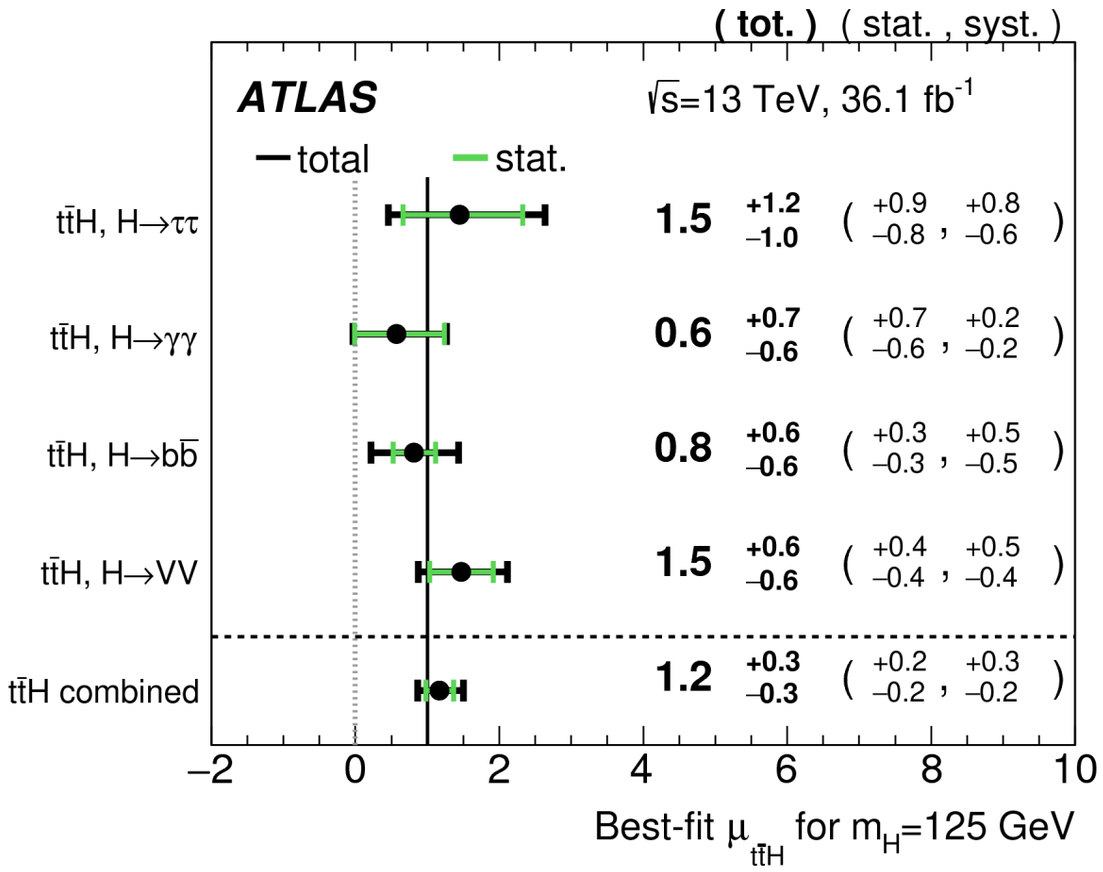


Normalisation factors	
Z + light jets	1
Z + light + c/b	1.3
Z + heavy jets	1.3

Evidence for ttH

[arXiv:1712.08891]





- **Search in different Higgs decay channels**
  - 2015+2016 LHC data set
- **ttH signal significance**
  - 3.8σ expected
  - **4.2σ observed**

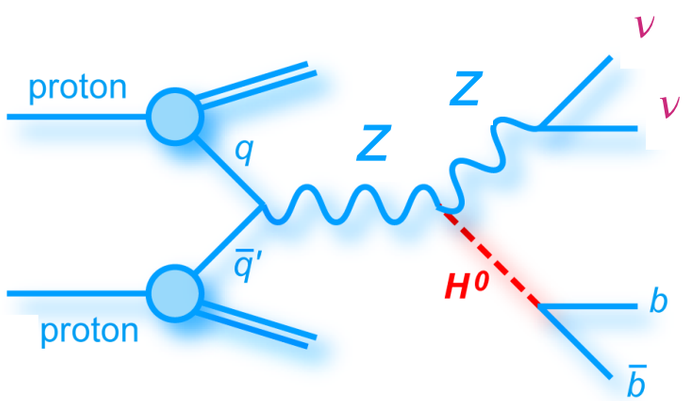
- Started analysis of 2017 data: **can allow observation!**
  - Currently comparing 2017 data and MC simulation, and validating MC
  - Studying observables sensitive to CP-properties of the Htt coupling **[S.Amor et al. arXiv:1704.03565]**

VH(H→bb) analysis

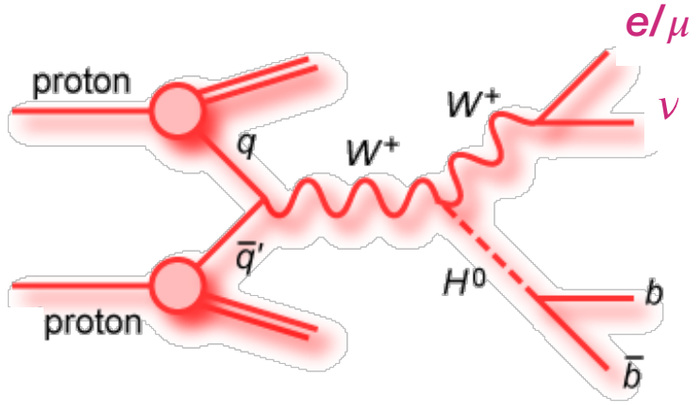
[arXiv:1708.03299]

P. Conde
R. Gonçalo
A. Maio
J. Maneira
M. Sousa
R. Pedro

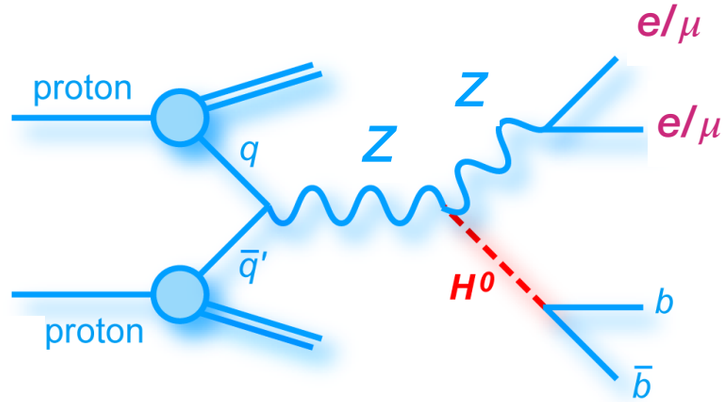
0 lepton

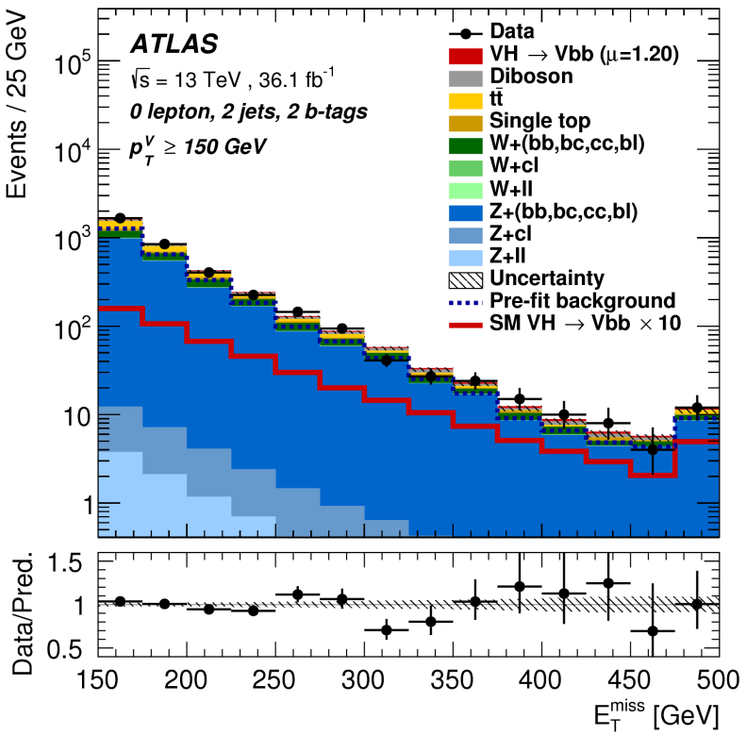


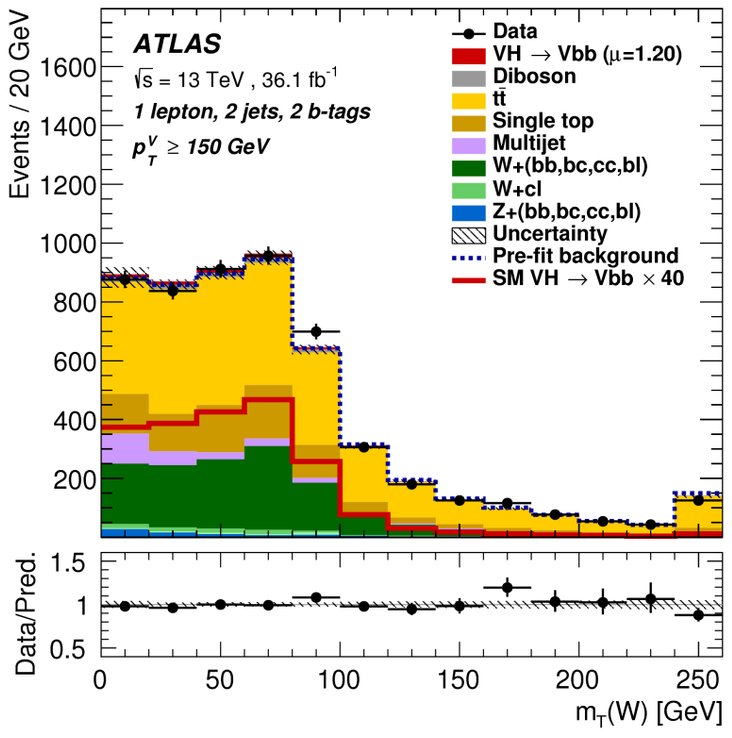
1 lepton

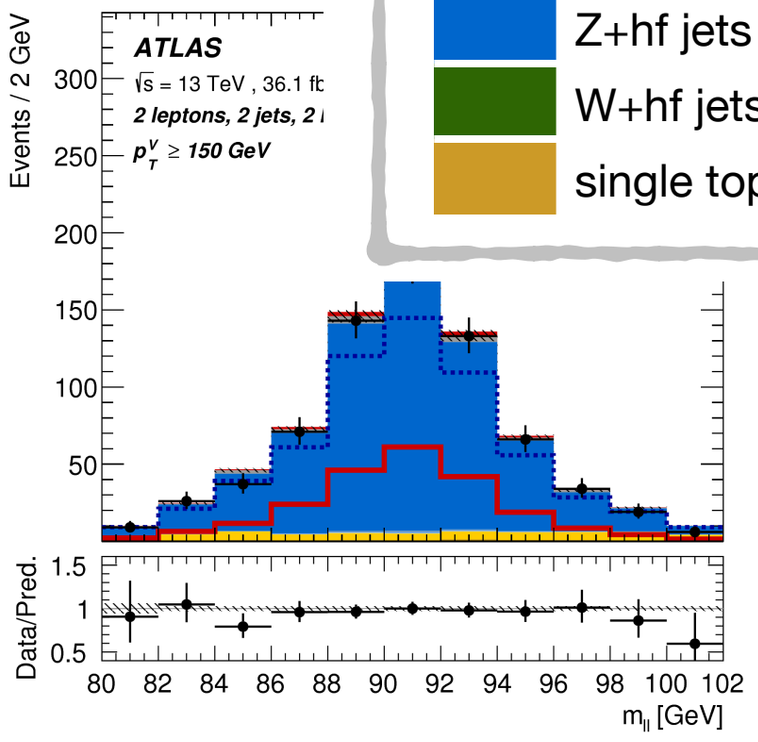


2 leptons







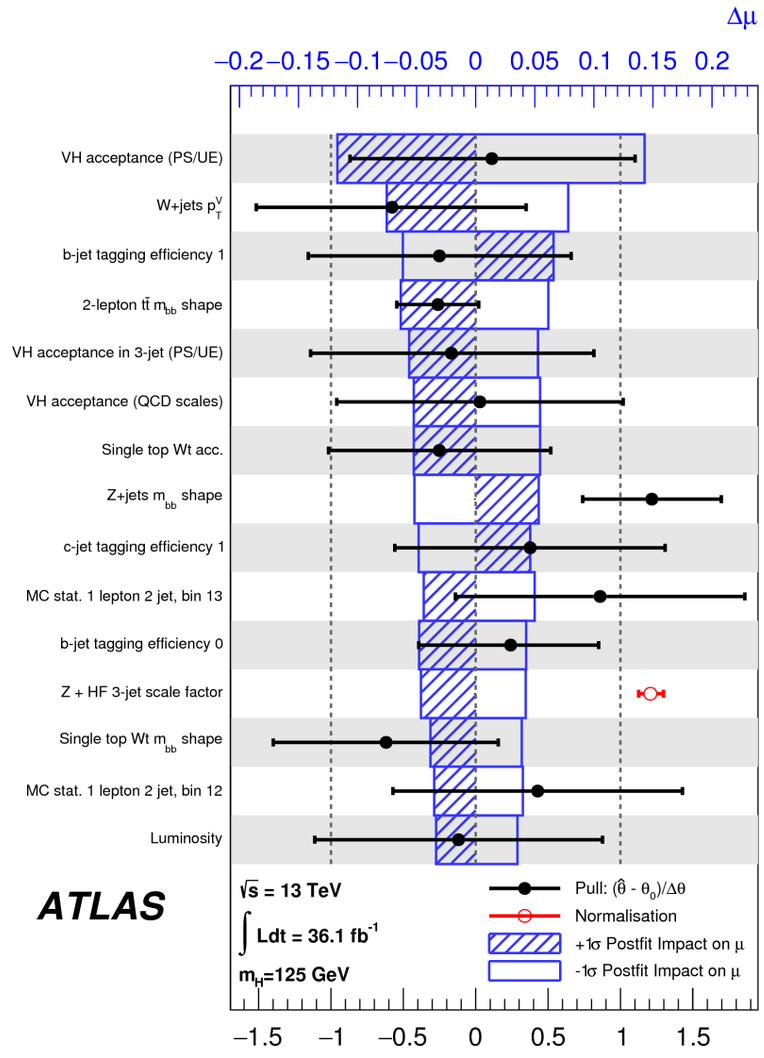


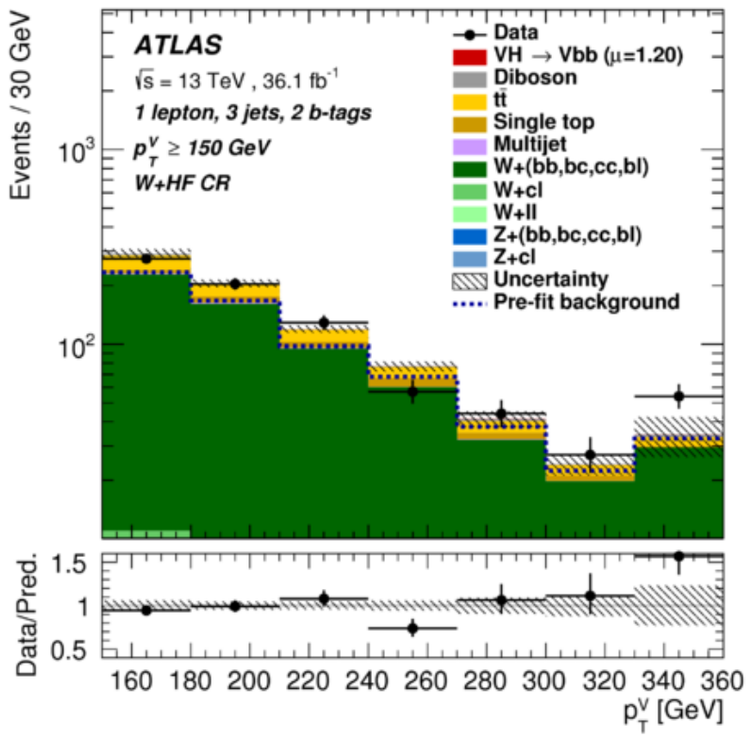
MVA and Statistical Analysis

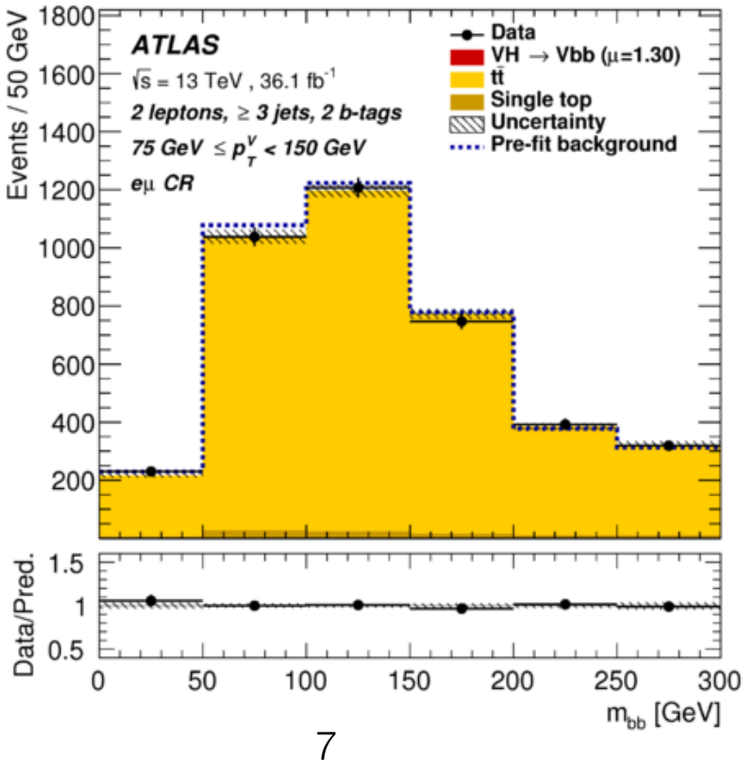
[arXiv:1708.03299]

- **MVA** method Boosted Decision Tree
  - Contribute to **BDT optimisation**
  - Two new discriminants **increased sensitivity up to 10%**

- Simultaneous **profiled Likelihood fit** to all regions
  - Very pure background-enriched samples
  - Normalisation of main backgrounds determined from data
  - **Responsible for fits** in the 2 lepton channel



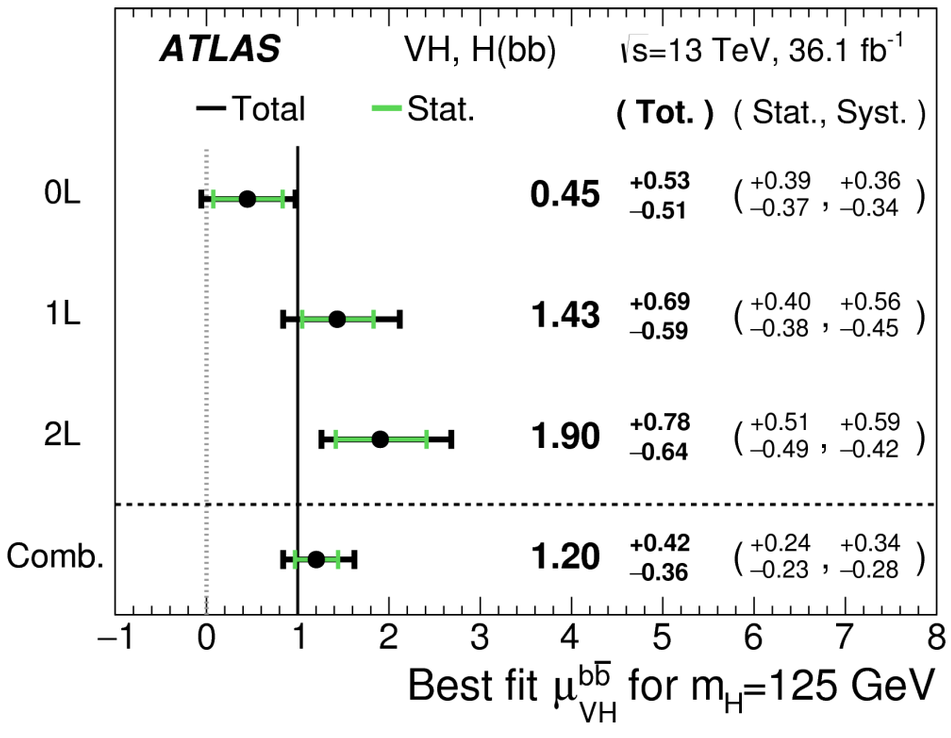


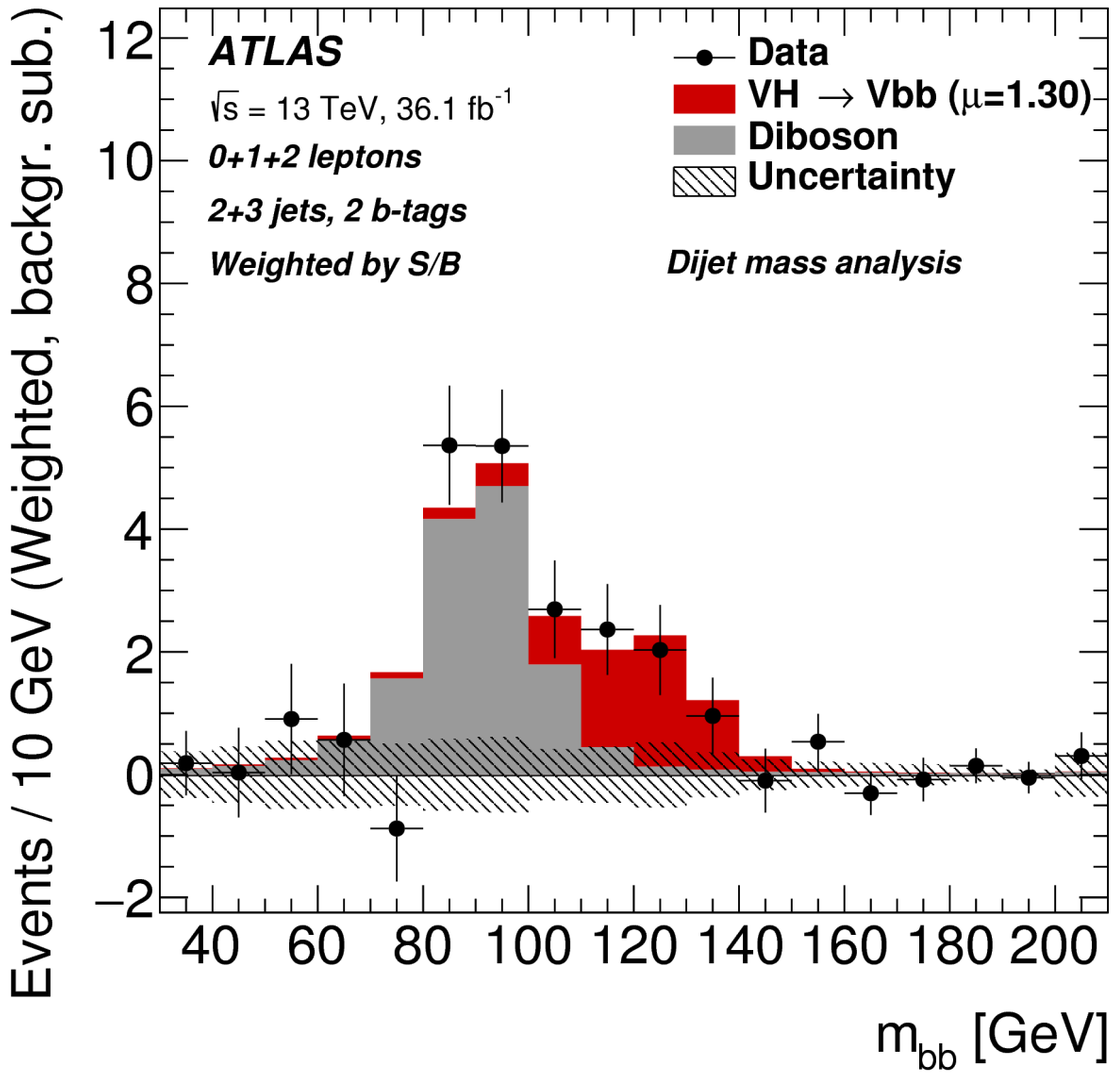


H→bb evidence

[arXiv:1708.03299]

- **Combining Run1 and Run 2 data** (2015 + 2016)
- Analysis **cross-checks**
  - Diboson measurement
  - Non-MVA analysis: “cut-based” fit to m_{bb}
- **VH(H→bb) signal significance**
  - 2.8σ expected
  - **3.5σ observed**

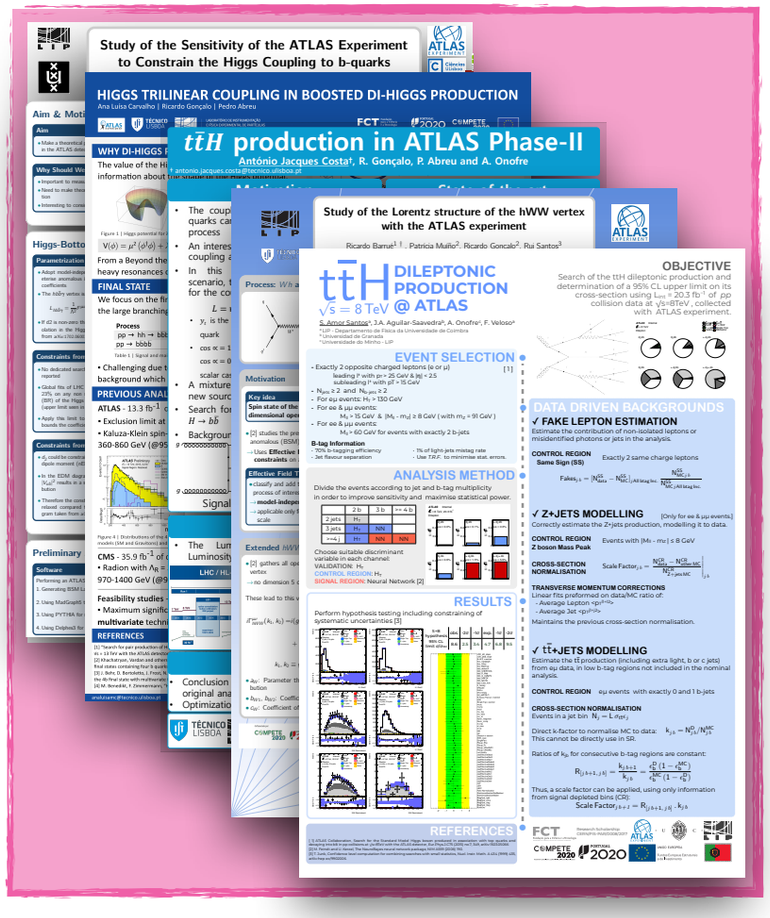




Conclusion and prospects

- **H→bb one of the most difficult Higgs search channels**
  - Long term effort starts to pay off
  - **Evidence for H→bb, VH and ttH** production

- Analysis of **2017 data** started**, may lead to observations**
- **Preparing the future measurements…**



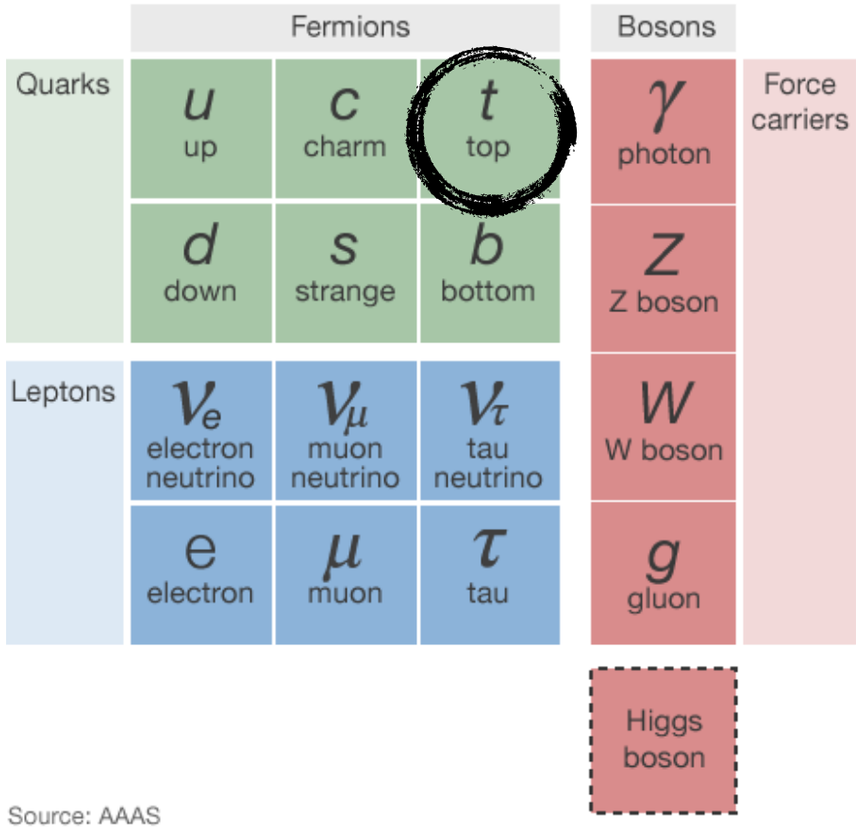
- Sensitivity of ATLAS to constrain the Higgs couplings to b-quarks
- Higgs Tri-linear coupling in boosted di-Higgs production
- Lorentz structure of the HWW vertex with ATLAS
- ttH di-leptonic production at ATLAS
- ttH production in ATLAS Phase-II

Top-quark Physics

B Galhardo
on behalf of the LIP ATLAS top-quark team

Jornadas do LIP 2018
Évora

Top Quark



Source: AAAS

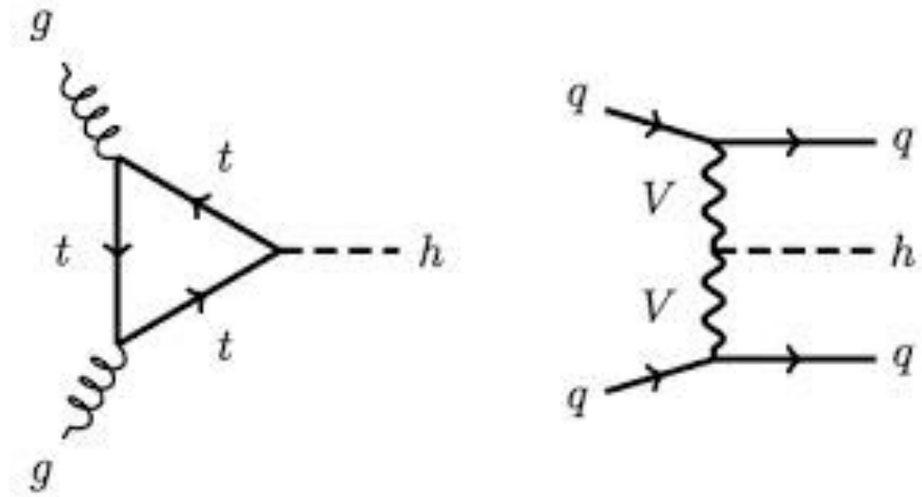
Why study top properties?

- Test Standard Model (SM) predictions
- Search for new Physics

- Mass = 173.1 ± 0.6 GeV [PDG]

Heaviest of all fundamental particles in the SM

Largest mass ➙ Largest coupling to SM Higgs

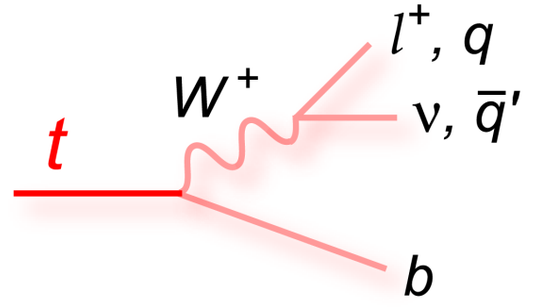


- Decays before hadronization: $\tau \sim 10^{-25}$ s

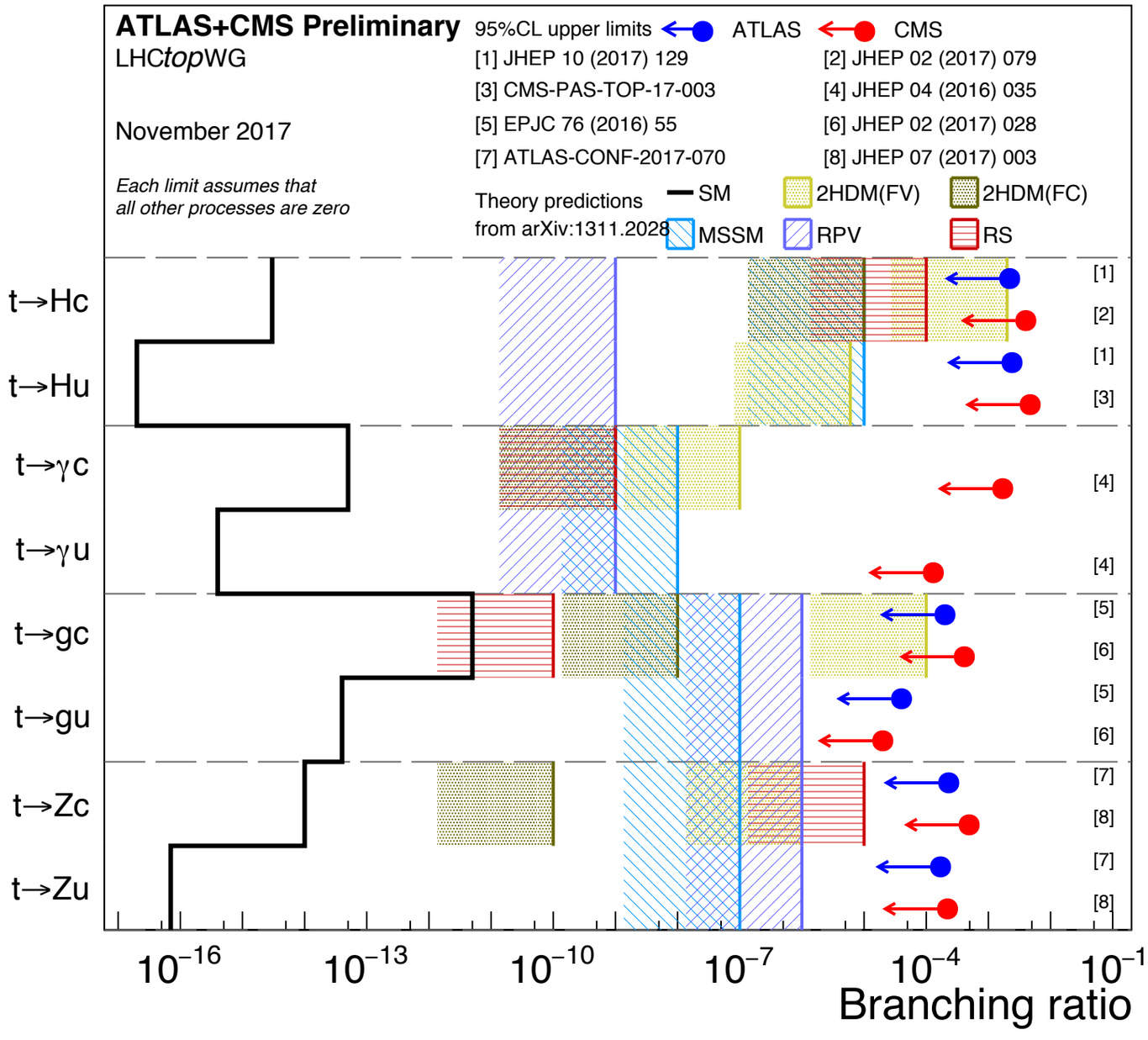
(spin information passes to the decay products)

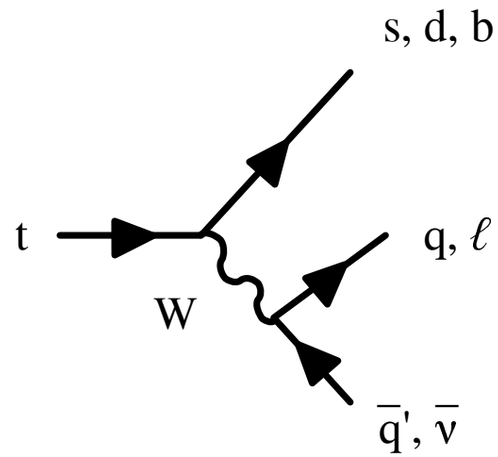
- Dominant decay to t → Wb

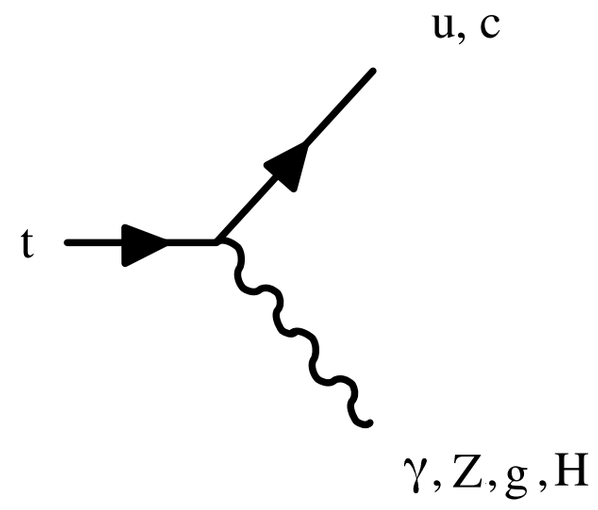
($|V_{tb}| > 0.999 \Rightarrow BR(t \to Wb) \sim 1$)



FCNC searches - Motivation

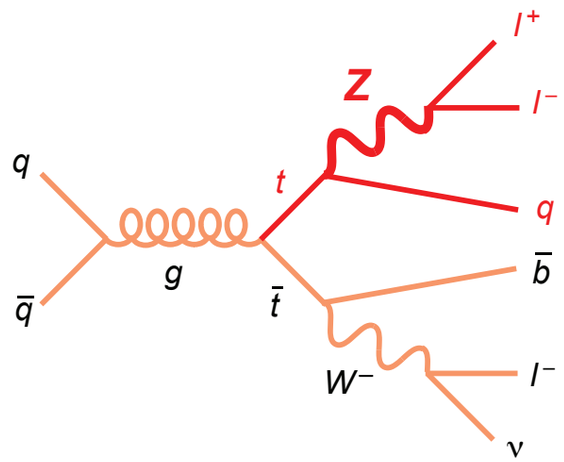






- FCNC top quark decay BRs are suppressed in the SM by the GIM mechanism.
- They can be significantly enhanced in some SM extensions
- Any significant signal will indicate the existence of new physics

Search for FCNC t->qZ decays @ 13 TeV



- Top-quark pair-production decays
  - t->qZ (FCNC decay)
  - t->bW (dominant SM decay with BR~1)
- Leptonic boson decays
- Final state: 3 leptons, 2 jets (1 b-tagged jet) , one neutrino

See **Bruno Galhardo** poster for more details

TEAM: F. Veloso, B. Galhardo, N. Castro with Tbilisi and Stockholm groups

Event Selection

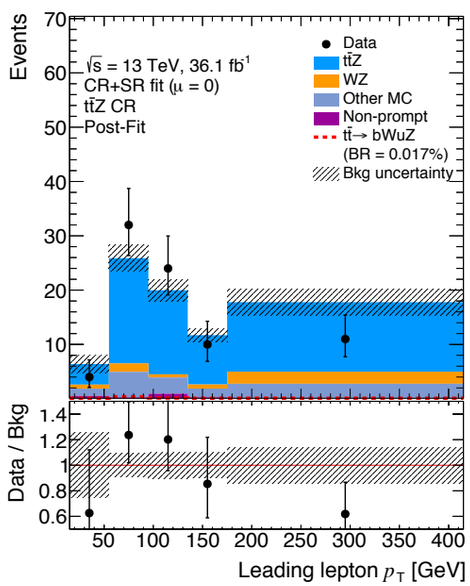
- = 3 leptons
- 2 leptons with same flavour, opposite charge
- $|m_Z - m_{l^+l^-}| < 15$ GeV
- ETmiss > 20 GeV
- >= 2 jets and 1 b-tagged jet
- $|m_W - 80.4\ \text{GeV}| < 30$ GeV
- $|m_t - 172.5\ \text{GeV}| < 40$ GeV

Reconstruction

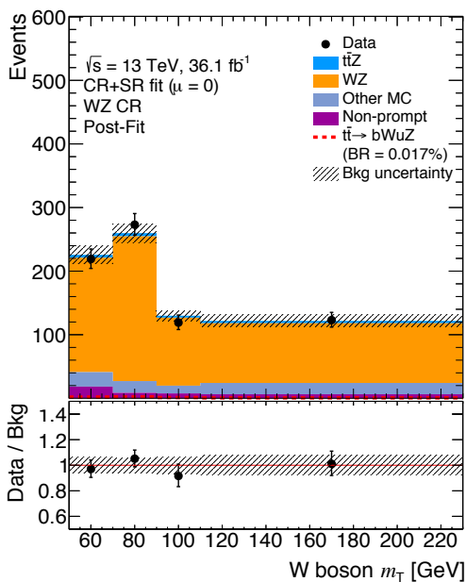
$$\chi^2 = \frac{\left(m^{\text{reco}}_{j_a \ell_a \ell_b} - m_{t_{\text{FCNC}}}\right)^2}{\sigma^2_{t_{\text{FCNC}}}} + \frac{\left(m^{\text{reco}}_{j_b \ell_c \nu} - m_{t_{\text{SM}}}\right)^2}{\sigma^2_{t_{\text{SM}}}} + \frac{\left(m^{\text{reco}}_{\ell_c \nu} - m_W\right)^2}{\sigma^2_W}$$

- $p_{T\nu}$ set to the MET
- q, b: 2 loops over the jets
- From all combinations, the one with the overall minimum χ^2 is chosen along with the corresponding p_ν value

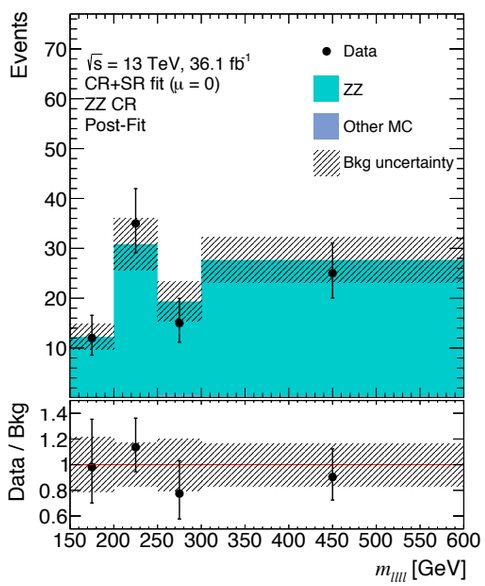
Background Control Regions



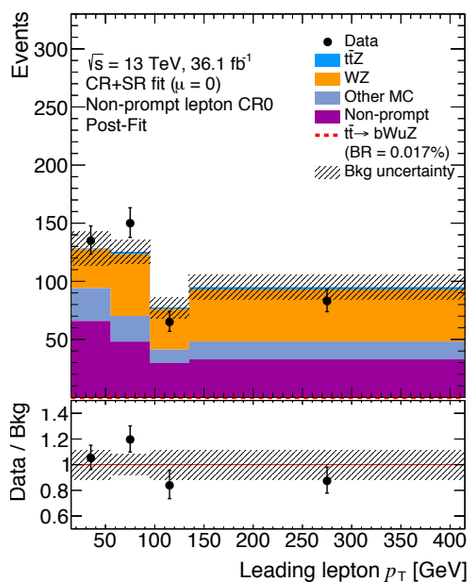
ttZ CR

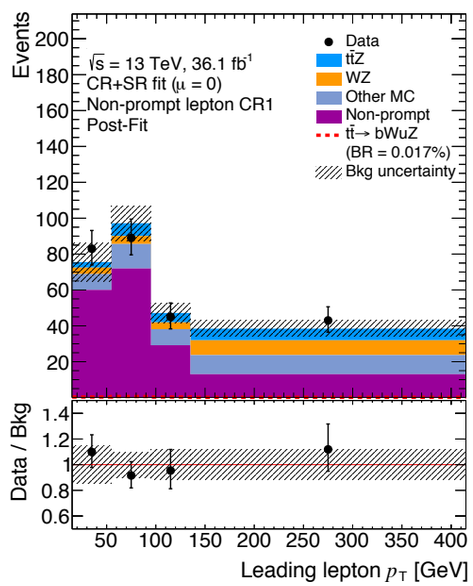


WZ CR



ZZ CR





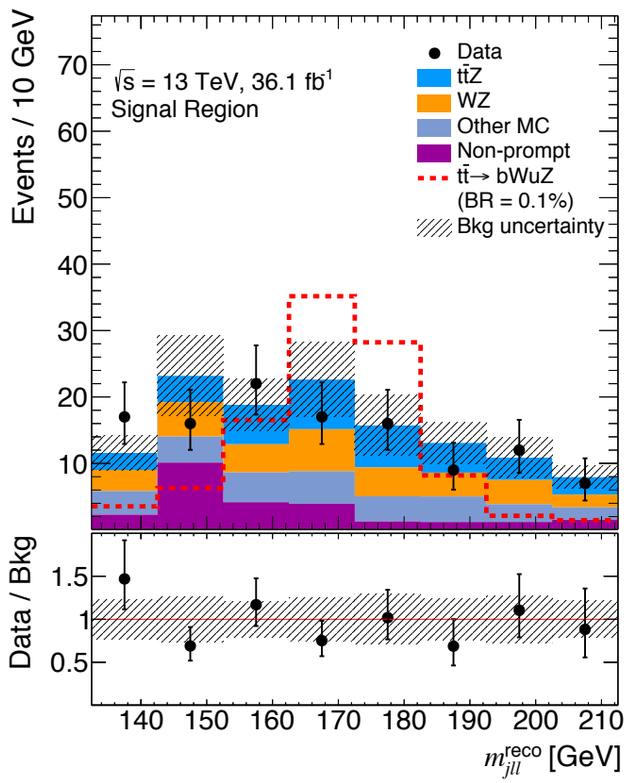
Fake-leptons CR

Results (L = 36 fb^{-1})

upper limits @ 95% CL

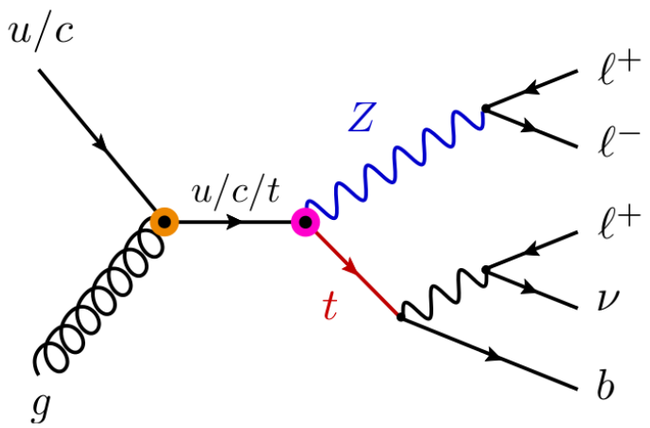
	BR(t->uZ)	BR(t->cZ)
observed	1.7×10^{-4}	2.3×10^{-4}
expected	1.7×10^{-4}	2.2×10^{-4}

New results are the most stringent limits up to date



[ATLAS-CONF-2017-070]

Search for FCNC tZ in single top production @ 13 TeV

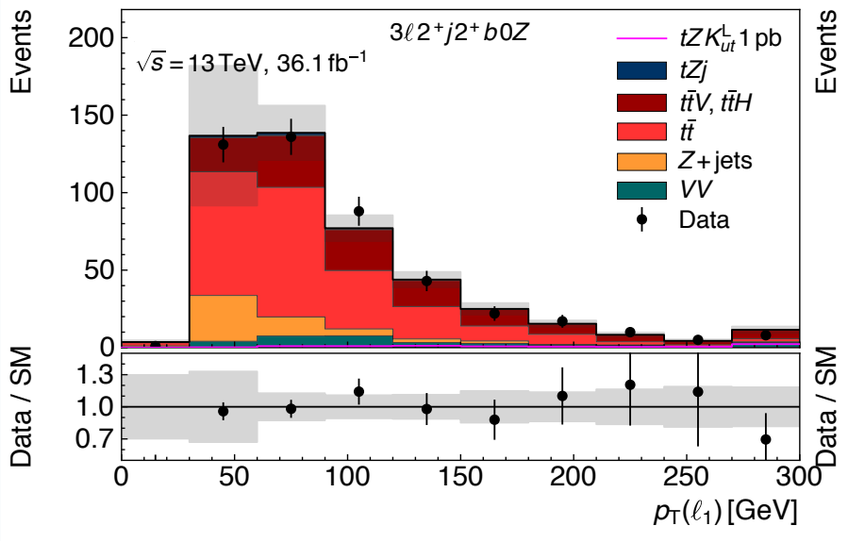


- Single top-quark production
  - t->bW (dominant SM decay with BR~1)
- Leptonic boson decays
- Final state: 3 leptons, 1 b-tagged jet, one neutrino
- Selection: = 3 leptons, 2 leptons OSSF and $|m_Z - m_{l^+l^-}| < 10$ GeV
  = 1 jets and 1 b-tagged jet

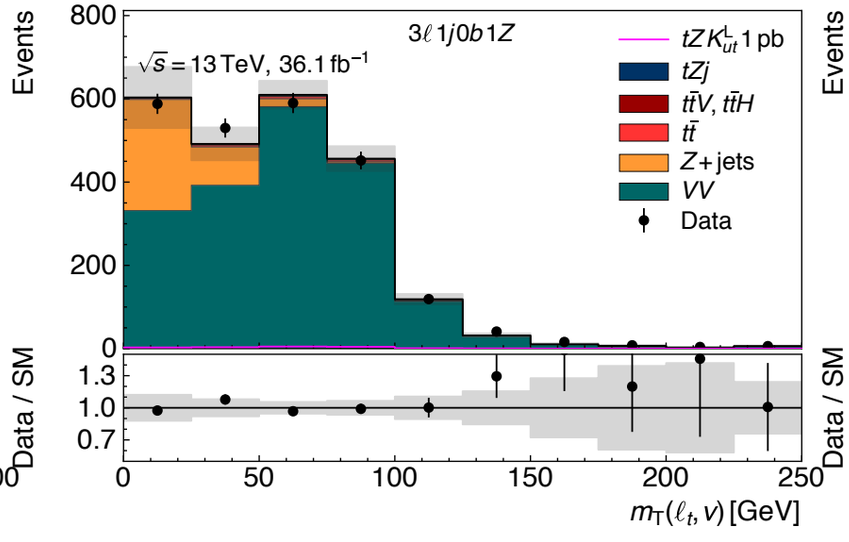
See **Ana Peixoto** poster for more details

TEAM: A. Peixoto, N. Castro, J. Araque with HU Berlin group

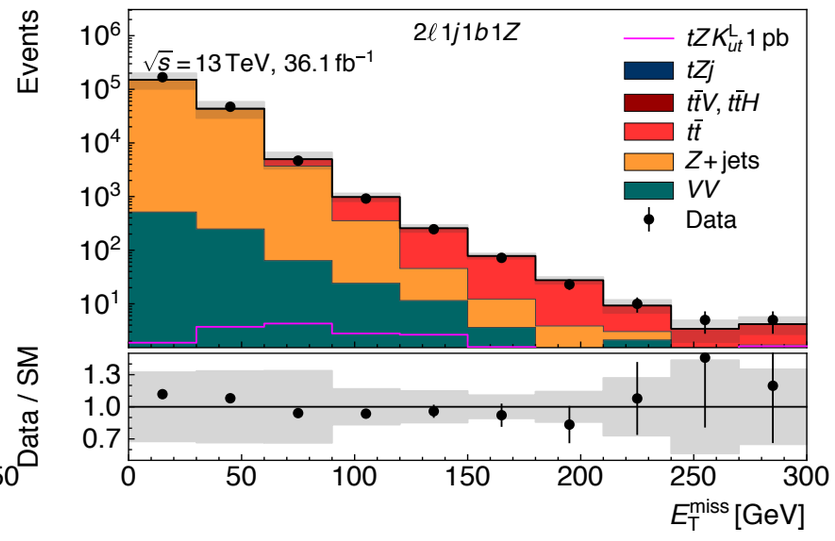
Background Control Regions



tt CR

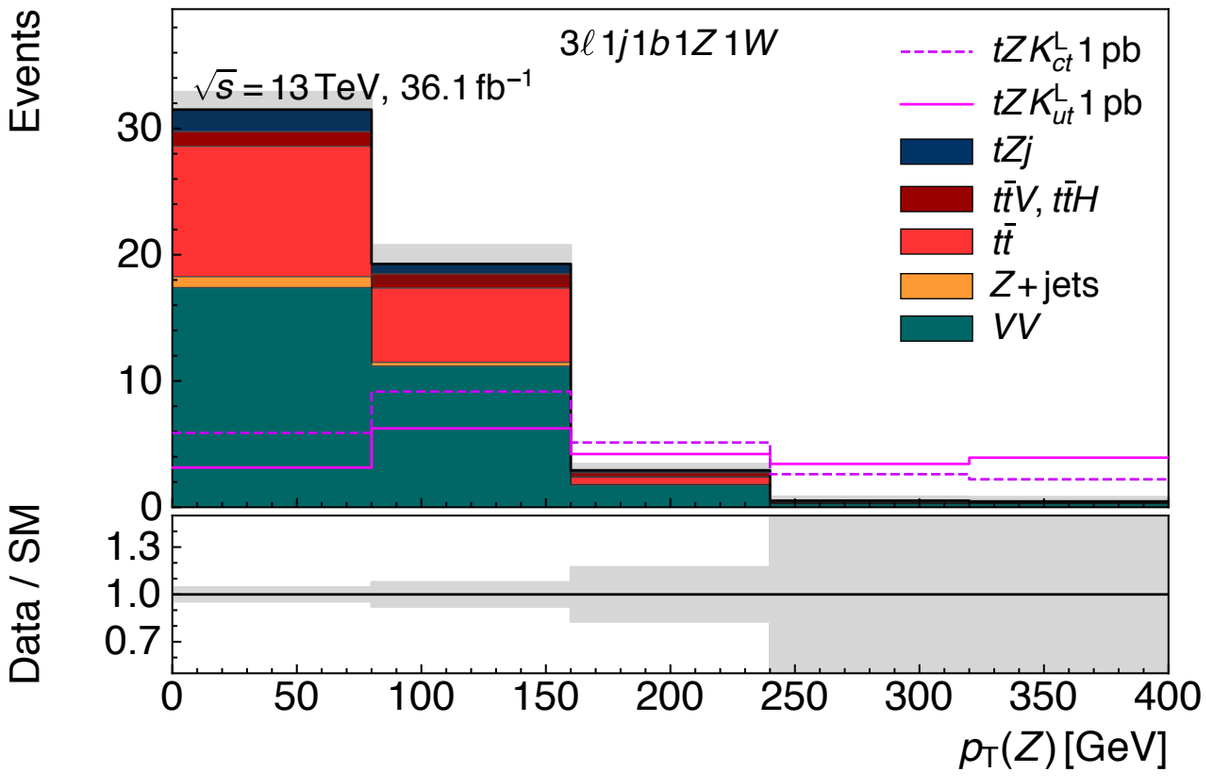


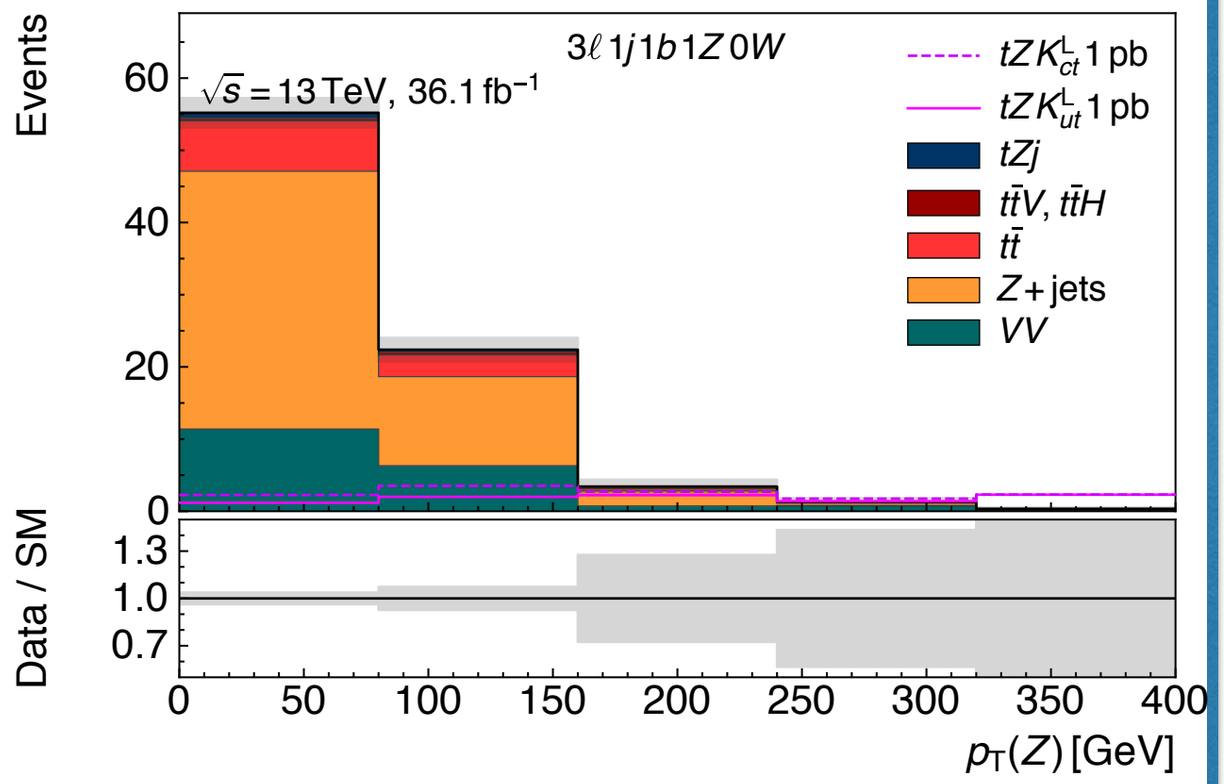
Diboson CR



Z+jets CR

Results - blinded (L = 36 fb^{-1})



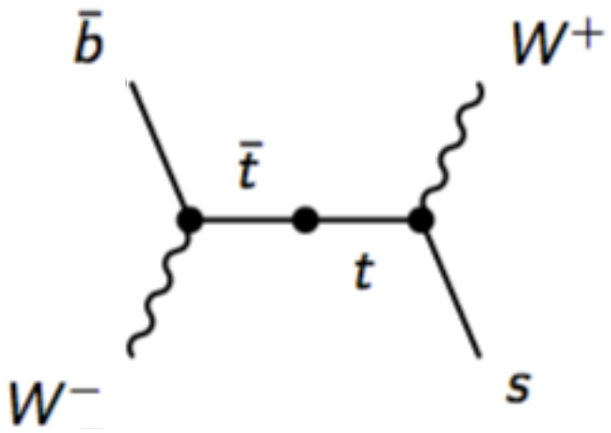


upper limits @ 95% CL

	BR(t->uZ)	BR(t->cZ)
expected	2×10^{-4}	2×10^{-3}

Interference in the tZq vertex between production and decay is discussed in **Maura Barros** poster

Top decays to sW @ 13 TeV



Top-quark pair-production decays

- t->bW (dominant SM decay with BR~1)

Leptonic W boson decays

Final state: 2 leptons, 2 jets, two neutrinos

Selection: 1e + 1μ, opposite charge, >= 2 jets and 1 non b-tagged jet

See **David Fernandes** poster for more details

TEAM: D. Fernandes, F. Veloso, B. Galhardo with Dortmund group

Expectations (L = 150 fb^{-1})

SM

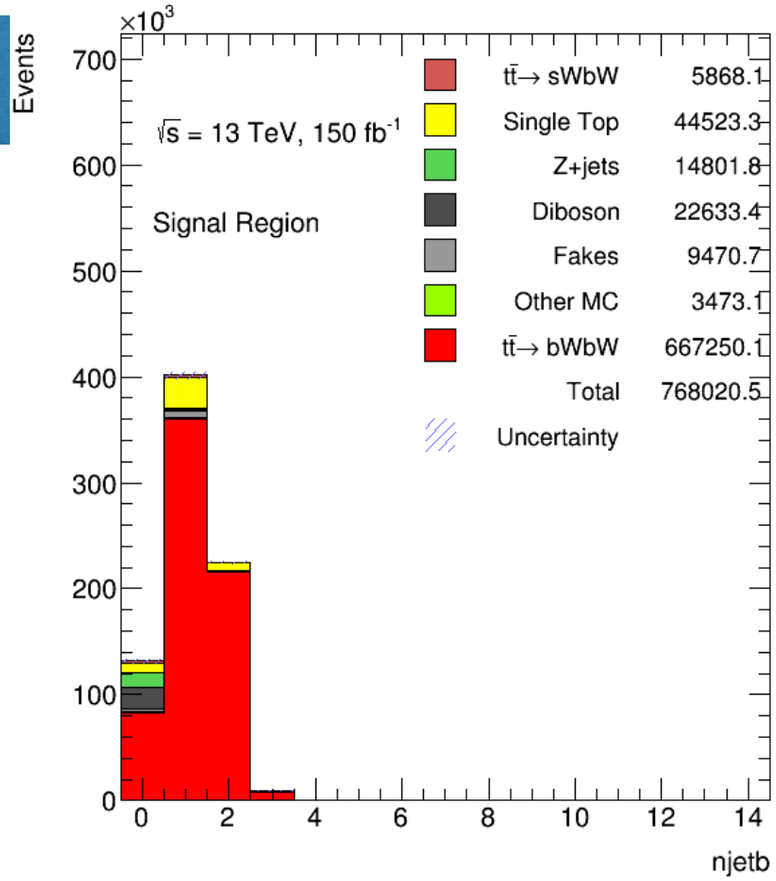
$|V_{tb}| = 0.9915$

$|V_{ts}| = 0.0403$ → **BR(t->sW) =1.6 × 10^{-3}**

$|V_{td}| = 0.0086$

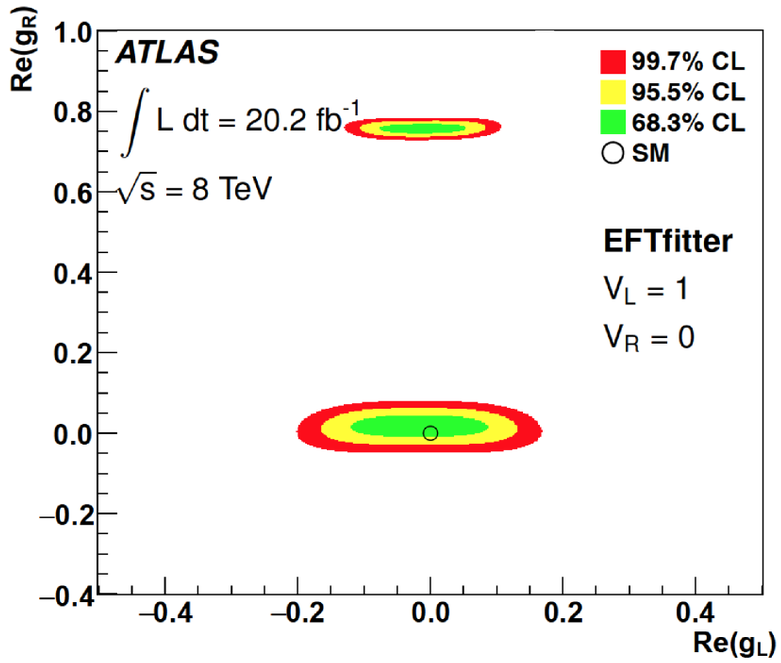
upper limits @ 95% CL

	BR(t->sW)
expected	2.5 × 10^{-3}



Effective Field Theory group

- The ATLAS top group created a task force for the interpretations of top measurement from an EFT point of view
- The goal is to perform a global fit considering all the O(6) effective operators relevant for the top-quark
- Contributions in the W polarisation measurement in top-quark decays and in the measurement of top polarisations and correlations of top-antitop in ttbar.
- Development of EFTfitter (in collaboration with Dortmund), a tool that allows to combine measurements in the scope of EFT



Summary

- FCNC search for tqZ in both production and decay
- Preliminary results on the top decay to sW
- LIP contributions in the EFT top group
- Also, important role in the coordination and revision of:
  - Measurements of top quark spin observables in tt events using dilepton final states

[doi:10.1007/JHEP03(2017)113]

Exotics group @ATLAS-PT

J. P. Araque
for the Exotics group at LIP-Minho

Jornadas de LIP 2018
Évora 16/18 Fev.

Heavy quarks

The Exotics group

GitLab integration for Publications

ATLAS Forward Detector

Editorial boards

Physics Office Publications

Heavy quarks

- **Juan Pedro Araque**
- Nuno Castro
- Tiago Vale
- Maria Ramos
- João Pedro Marado

Monotop

- **Nuno Castro**
- Juan Pedro Araque

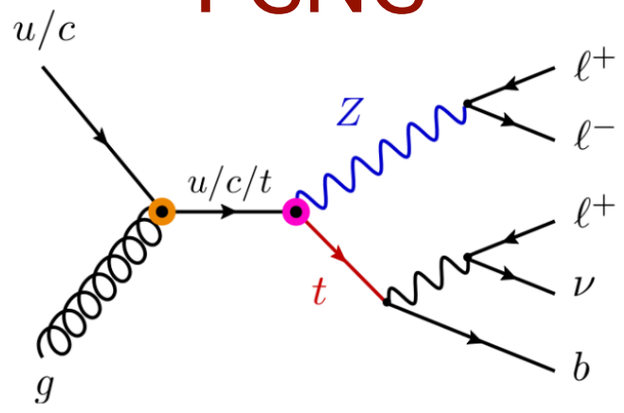
FCNC

- **Nuno Castro**
- Juan Pedro Araque
- Ana Peixoto
- Maura Barros

(See talk from Bruno Galhardo)

FCNC and heavy quarks phenomenology

FCNC



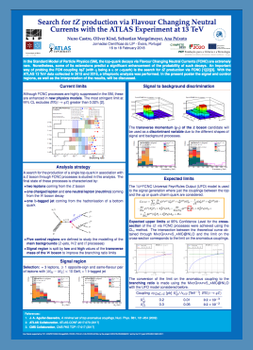
- ATLAS search for FCNC in top quark production
- Focus on leptonic top quarks with a leptonic Z boson
- Future studies of the interference effects with single top
- In collaboration with the Berlin University ATLAS group

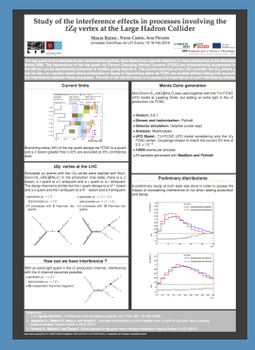
Bruno Galhardo will talk about FCNC in detail in his talk

More details about heavy quarks phenomenology in the phenomenology talk

Composite Higgs phenomenology

- BSM particle physics and cosmology
- Studying dark-matter and electroweak phase-space transition
- Interested on collider phenomenology of composite Higgs models and potential astrophysical signals
- Working in collaboration with Mikael Chala (Durham)





Maura and Ana are presenting a poster about their work for more details

Heavy quarks - ATLAS search

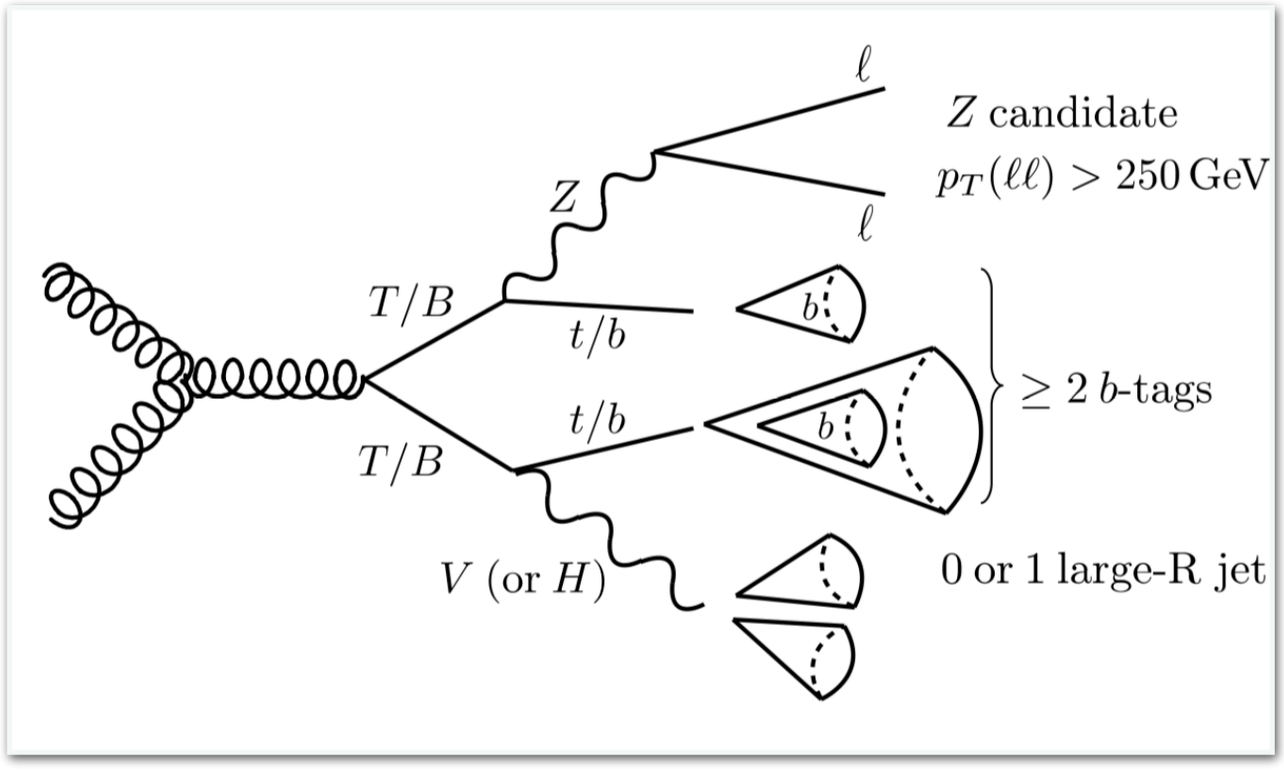
Search for pair and single production of vector-like quarks with at least one of them decaying to a Z boson

Pair

Dilepton — Dilepton — Trilepton

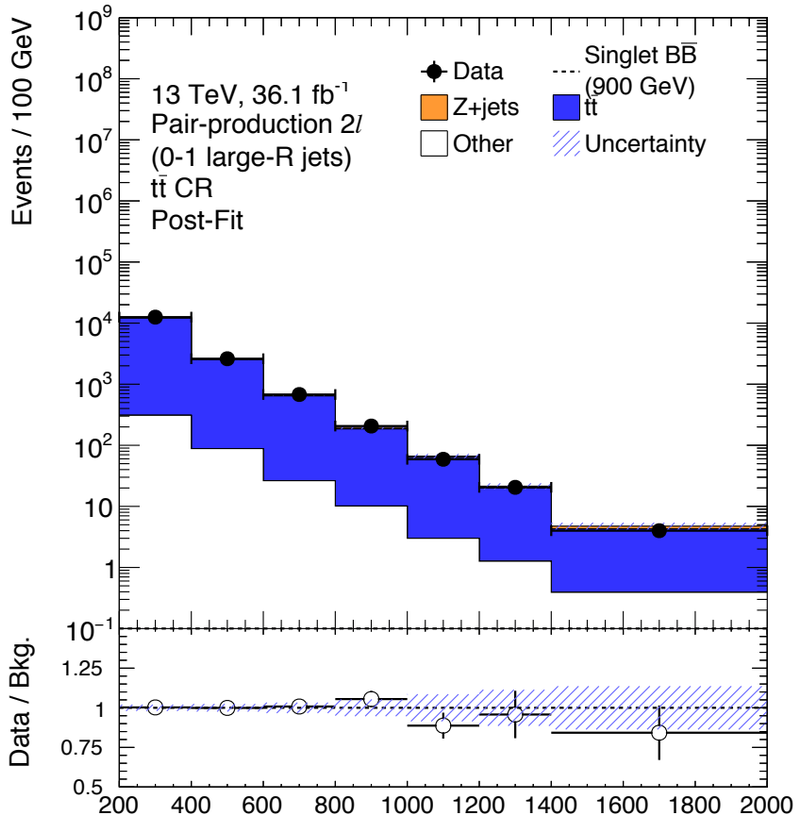
Single

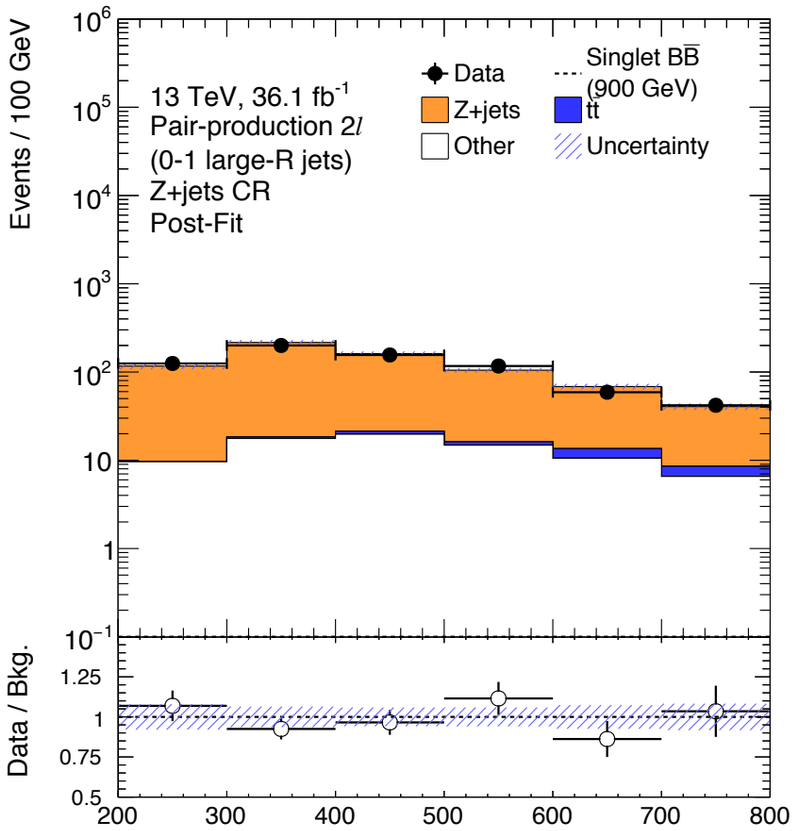
Trilepton — Dilepton



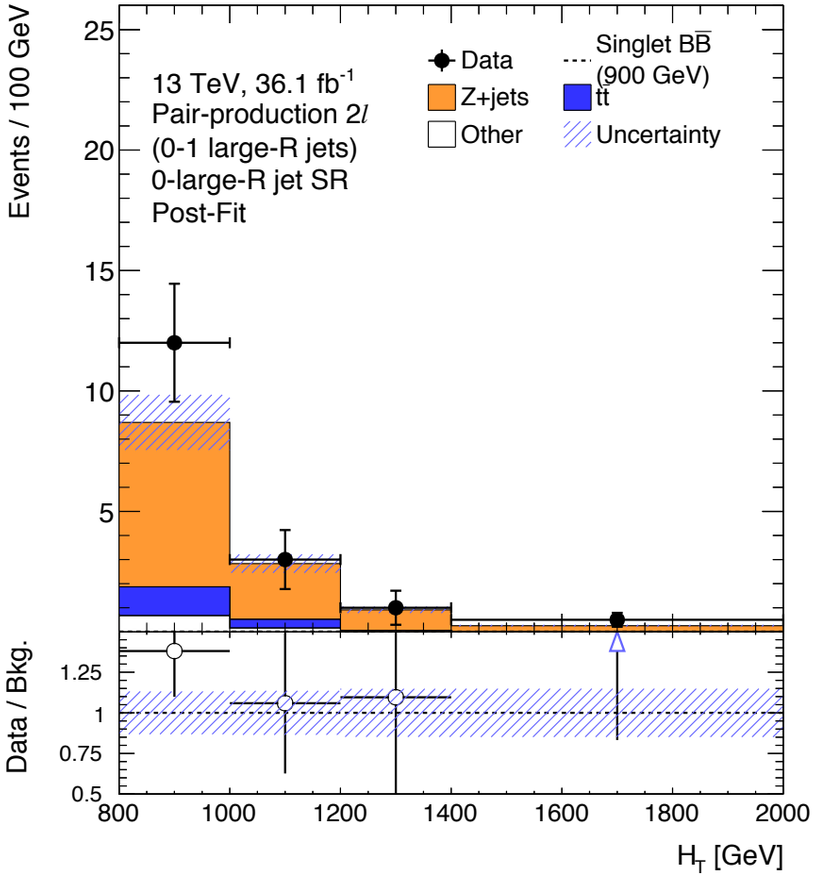
- At LIP we contribute as:
  - Coordination
  - Editors
  - Combination developers
  - Main analyzer for dilepton resolved channel
- General signature:
  - High statistics
  - Sensitive to modelling
  - High jet activity
  - A leptonic Z decaying from the vector-like quark

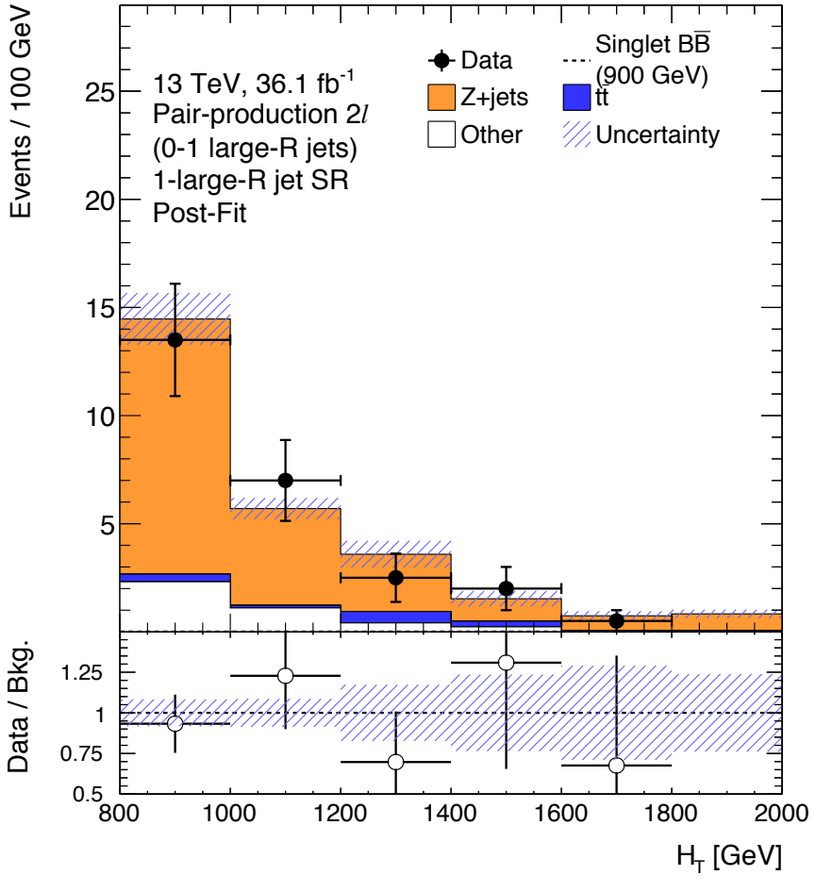
Heavy quarks - ATLAS search





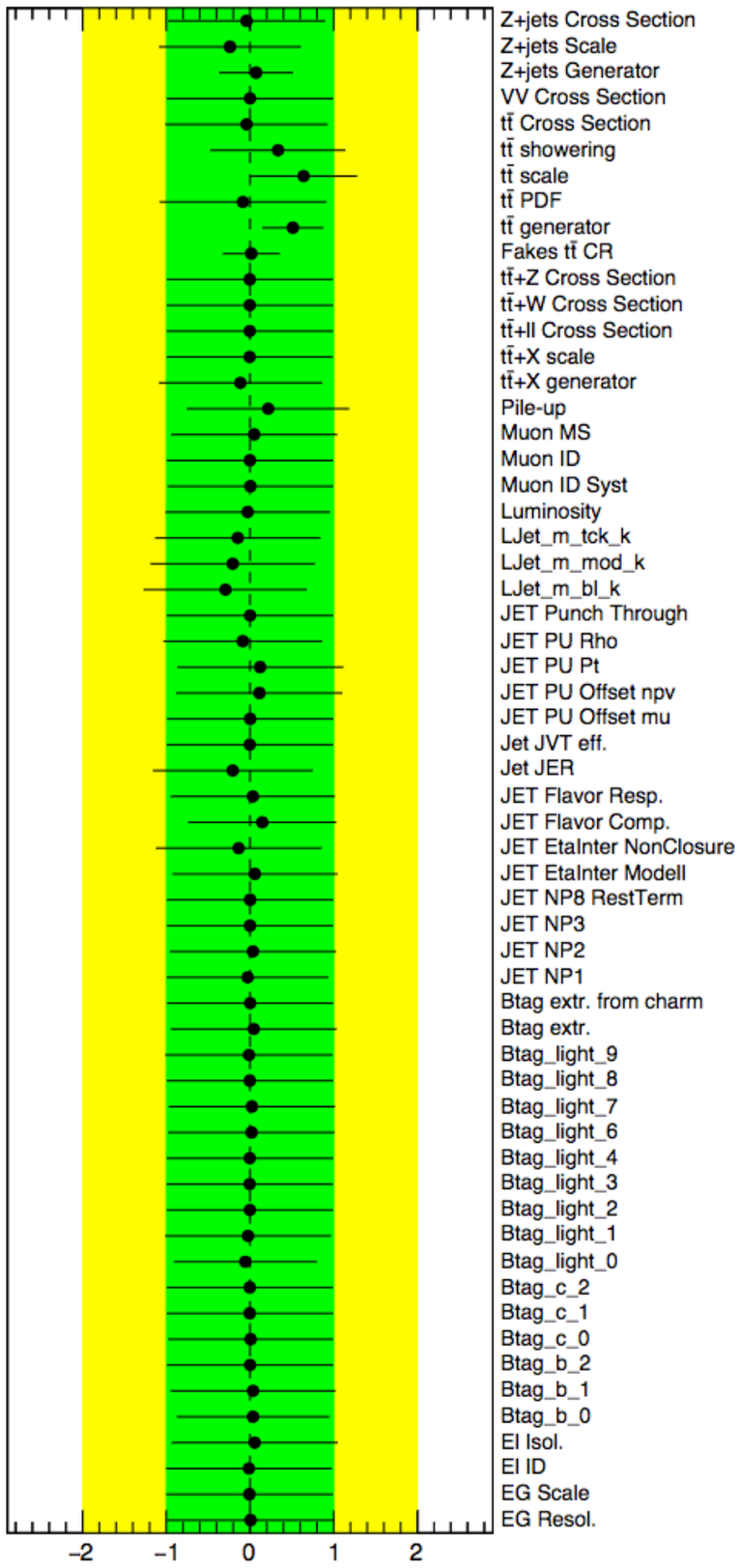
$t\bar{t}$ CR	Z+jets CR
SR-0	SR-1





- Control regions help to study the modeling of the major backgrounds and constrain systematic uncertainties
- Signal regions divided in two:
  - 0 large-R jets
  - 1 large-R jets

Heavy quarks - ATLAS search

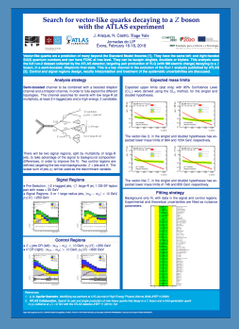


Log-likelihood fit

- A log-likelihood fit is done to data in the control and signal regions.
- The systematics uncertainties are treated as nuisance parameters of the fit.

Final combination

- All 5 channels (a total of 16 regions) will be combined for pair and single production to get the final exclusions limits
- Limits are expect to go beyond the 1 TeV mass point for both vector-like T and B

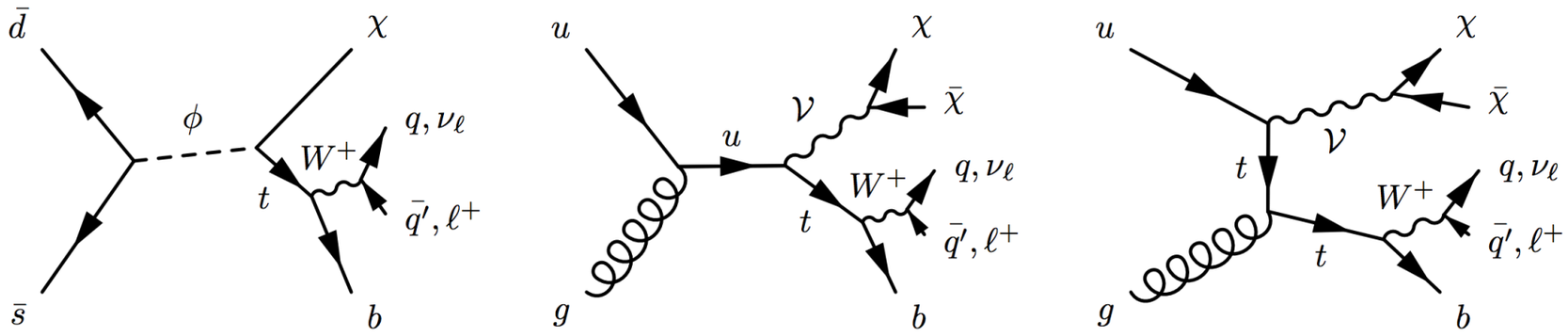


Tiago has a poster about the analysis for more details

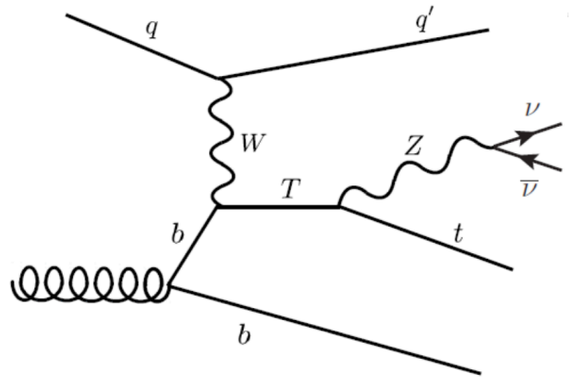
Monotop search

Search for monotop and single VLQ production: single top plus missing ET

Monotop

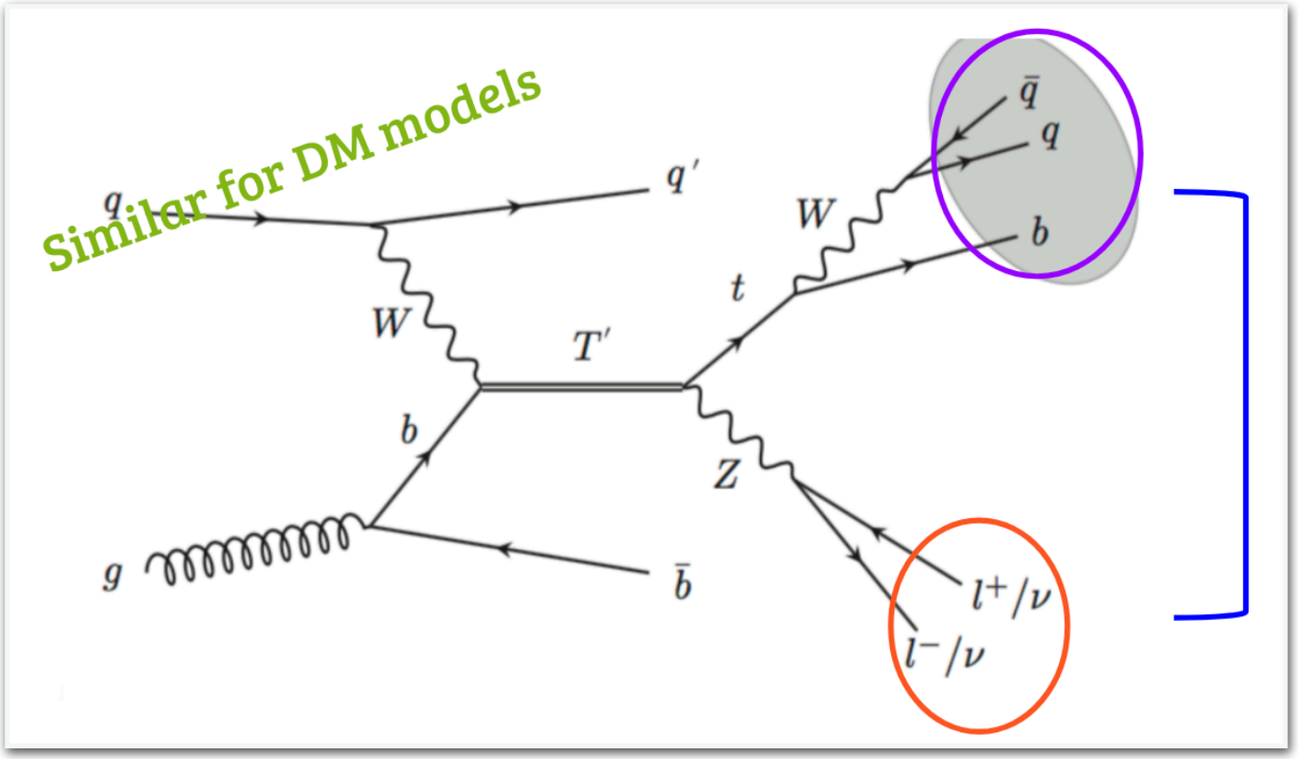


Single VLQ

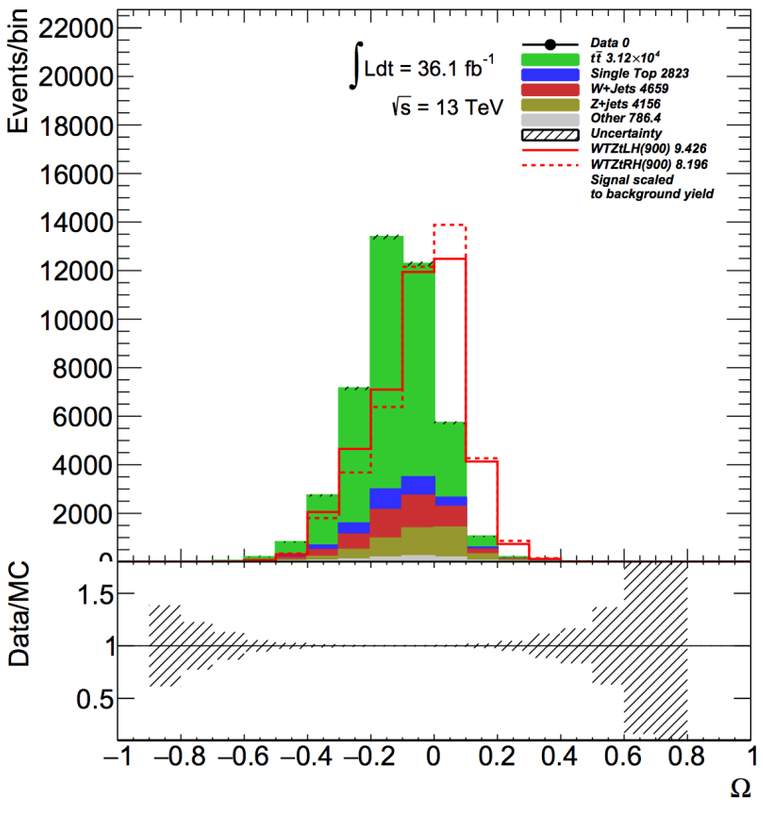


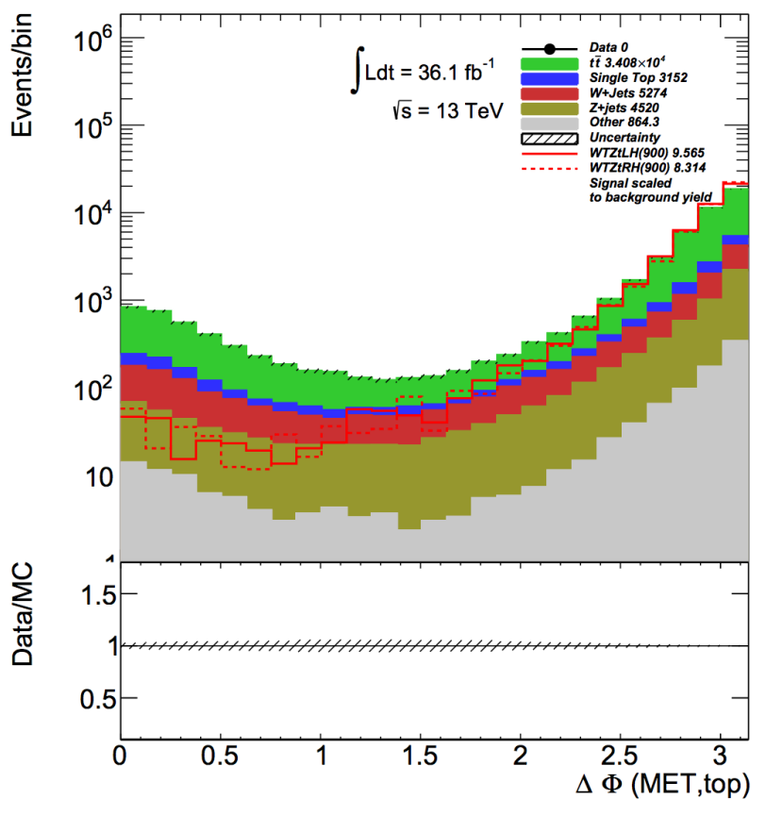
- Collaboration of different institutes taking care of different part of the analysis
- LIP is involved in the single-VLQ interpretation for the hadronic channel as well as coordinator and editor

Monotop search



- Hadronic and leptonic channels are defined based on the W decays
- High hadronic activity
- B-tagged track jets are used
- Multijet is the main background in the full hadronic channel
- Assumes boosted top quark using top-tagging techniques at 80% efficiency

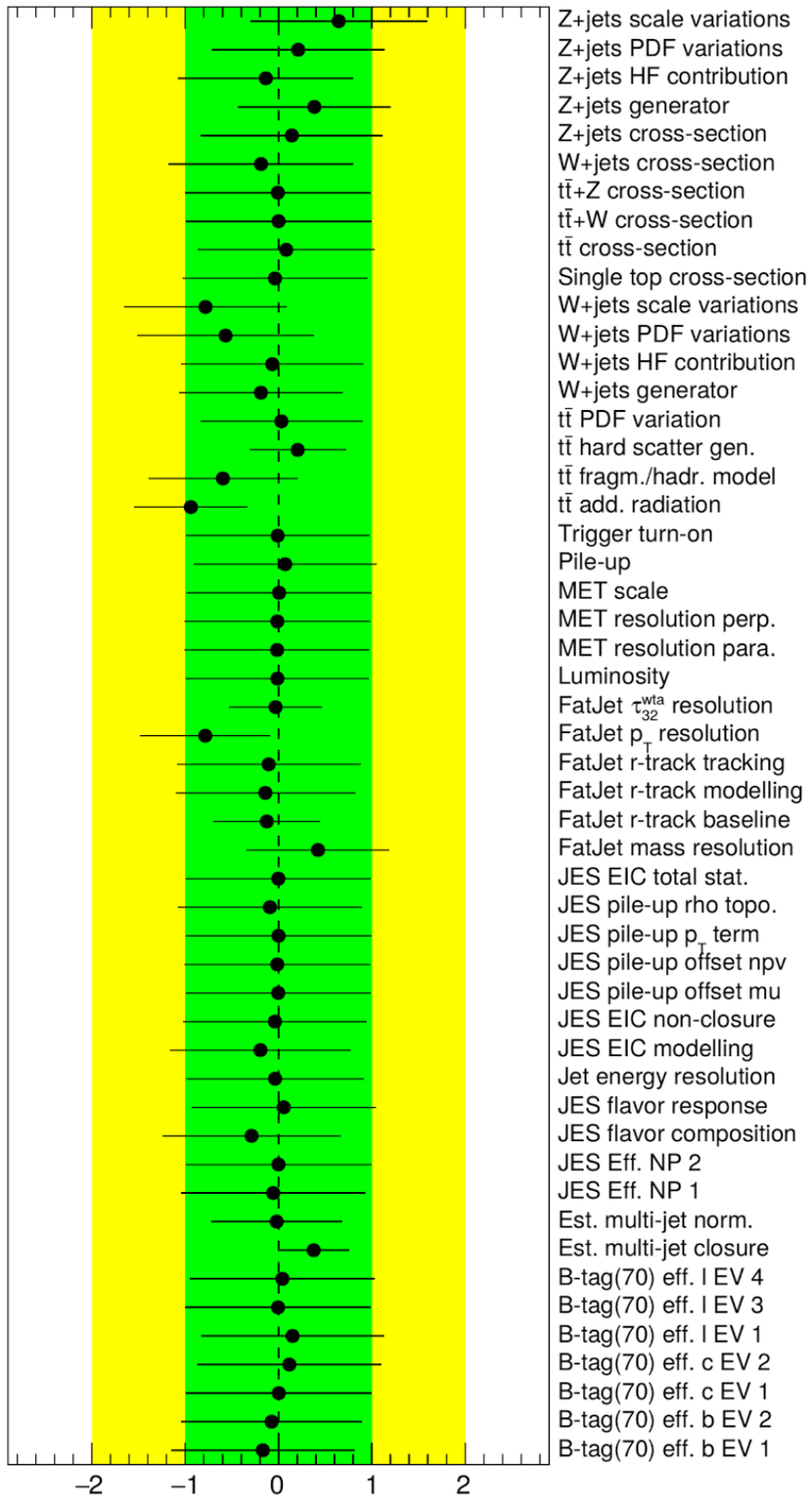




$$\Omega = \frac{\mathrm{MET} - p_T^{\mathrm{top-jet}}}{\mathrm{MET} + p_T^{\mathrm{top-jet}}}$$

- The asymmetry between the top-tagged jet and MET as well as ΔΦ(MET, top) are used to distinguish between signal and background
- At least a forward jet is required which is a common signature in single-VLQ production

Monotop search



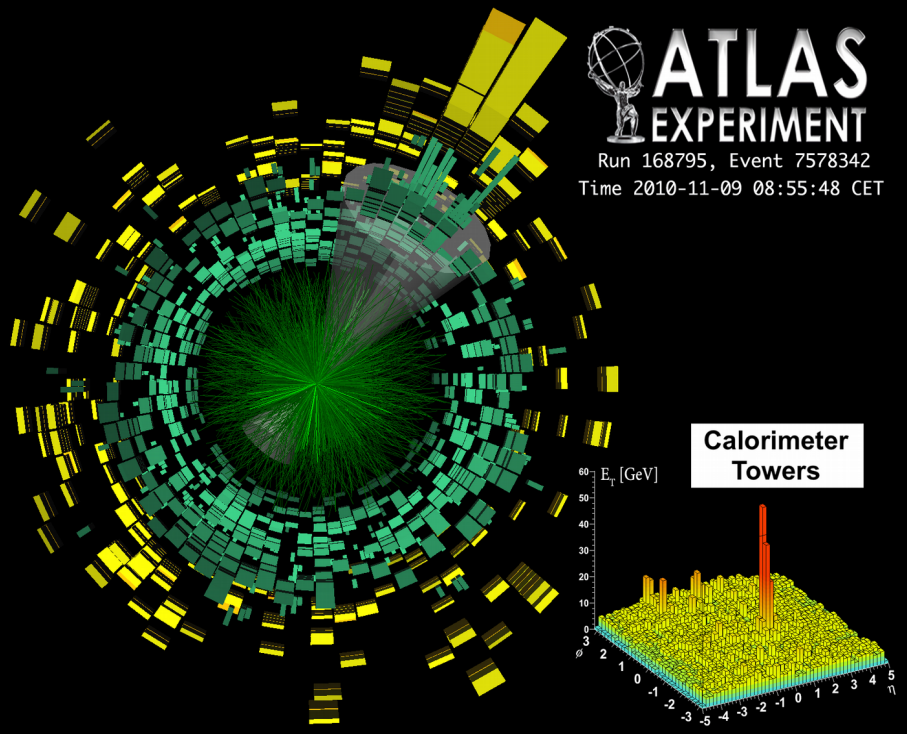
Log-likelihood fit

- A log-likelihood fit is performed including the systematic uncertainties as nuisance parameters
- Both leptonic and hadronic channels are combined fitting to data control and signal regions simultaneously
- Limits are set on the resonant and non-resonant DM scenarios, reaching the 3 TeV mass limit for the resonant mediator, as well as on the σxBR for the production cross-section of single vector-like quark production

Summary

- Heavy vector-like quarks:
  - ATLAS analysis well in advance now combining all different channels
  - Analysis review almost ready for ATLAS circulation
  - Expected publication in the next months
- Monotop:
  - Analysis was unblinded and approved recently
  - Big effort of the analysis team in the last months
  - Paper almost ready for ATLAS circulation
- FCNC in top quark production:
  - Unblinding for the Analysis expected
  - Publication expected this spring
- New students are joining the group working in new different fronts:
  - Phenomenology
  - FCNC interference
  - Machine learning for heavy VLQs

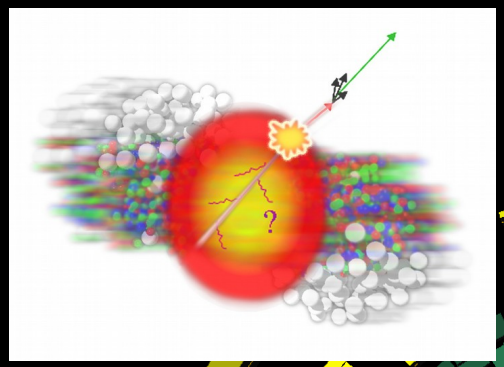
ATLAS heavy-ion studies at LIP

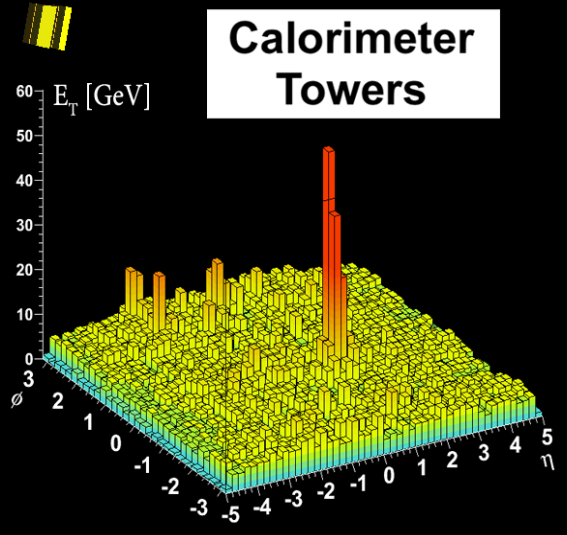


Rui Pereira
for the ATLAS LIP Heavy-Ion group

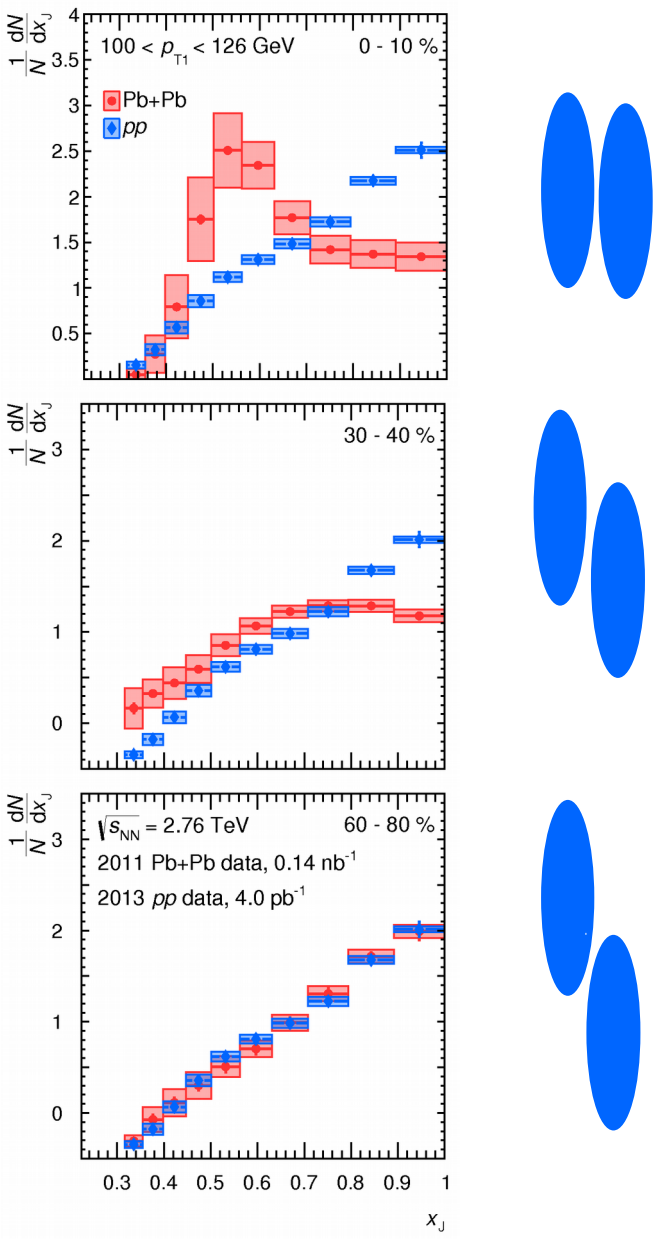
Jornadas LIP, Évora, 16 February 2018

Observed “jet quenching”





$x_J = p_{T2} / p_{T1}$



Dijet asymmetry probes differences in quenching between the two parton showers.

- The asymmetry in peripheral collisions is well compatible with pp collisions (no QGP formation)
- The asymmetry increases with collision centrality

Leading contribution from LIP ATLAS group

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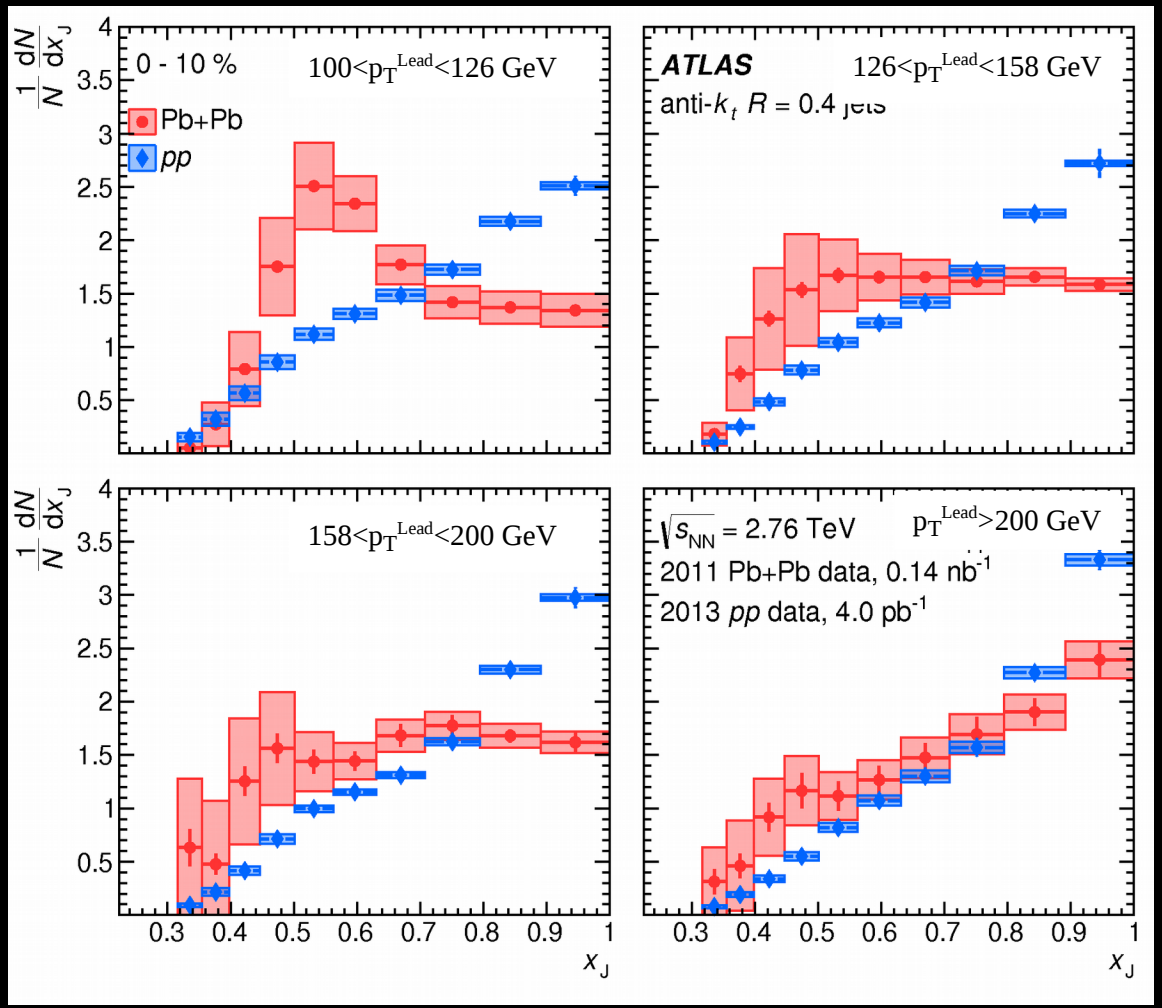
Dijet asymmetry in central collisions

p_T^{Lead} dependence in 0-10% centrality



Much smaller modification at high p_T^{Lead}.

Clear dependence with p_T of the leading jet, in contrast to single jets.

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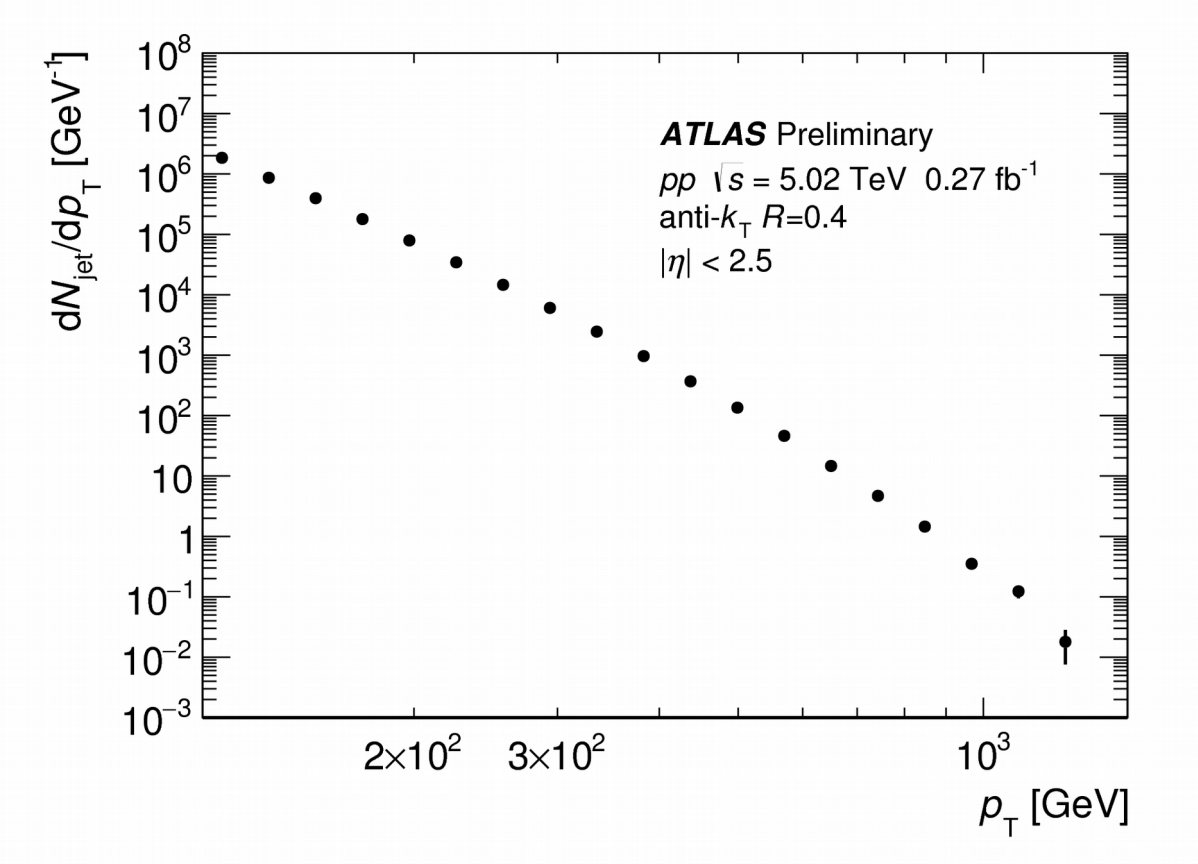
jet p_T distribution in the pp reference run



https://atlas.web.cern.ch/Atlas/GROUPS/PHYSICS/PLOTS/HION-2017-001/

The jet yield in pp collisions at √s = 5.02 TeV as a function of p_T in the |η| < 2.5 range.

Flavour tagging in heavy-ion events

Heavy-flavour jet physics important in HI studies: QGP probe, top quark searches...

Several types of b-tagging discriminants:

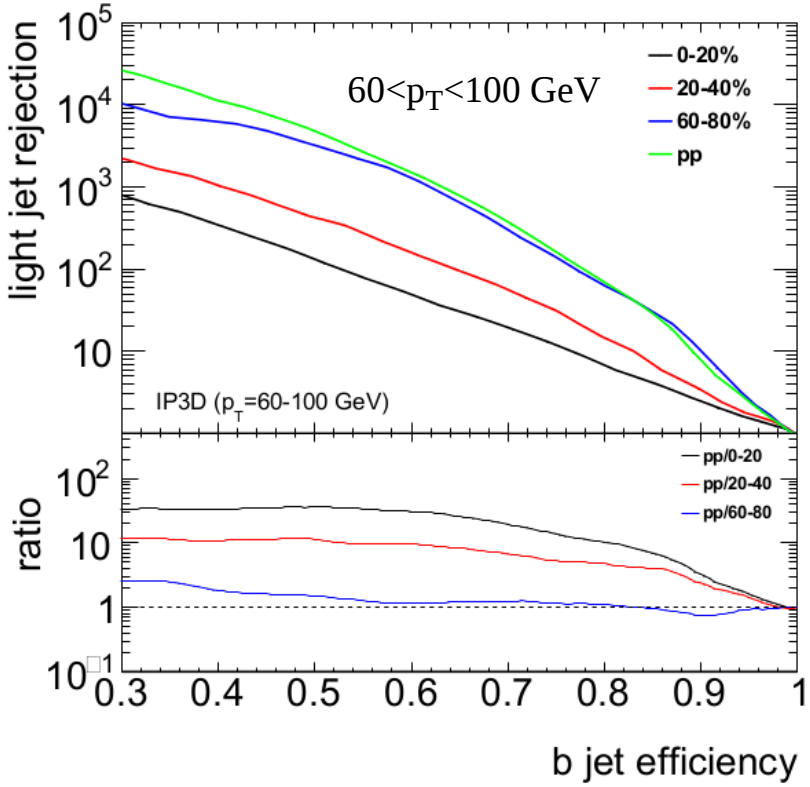
- based on impact parameter (IP3D)
- based on secondary vertex (SV1)
- multivariate, high-level (MV2c10)

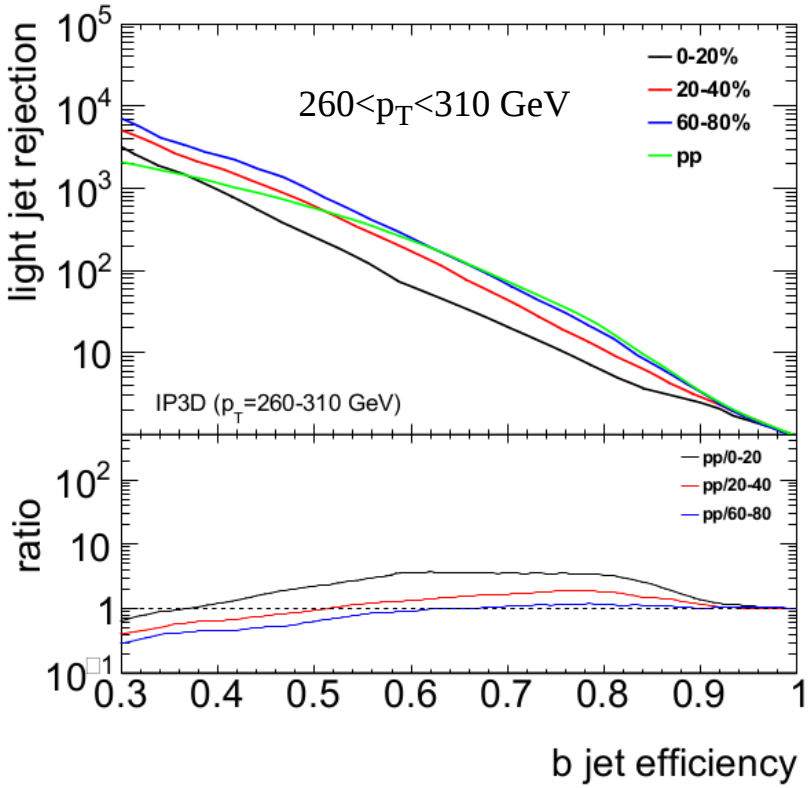
No sophisticated b-tagging was available for ATLAS heavy-ion events

- Specifics of HI collisions (e.g. underlying event) mean that pp algorithms will not work properly

R. Pereira joined group in September 2016

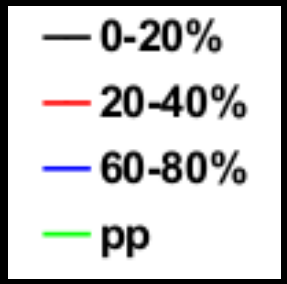
HI flavour tagging: centrality effect





Example shown: IP3D

- Better result for peripheral collisions (similar to pp) than for central collisions - working to improve result for central
- Effect of centrality is stronger for jets with lower p_T

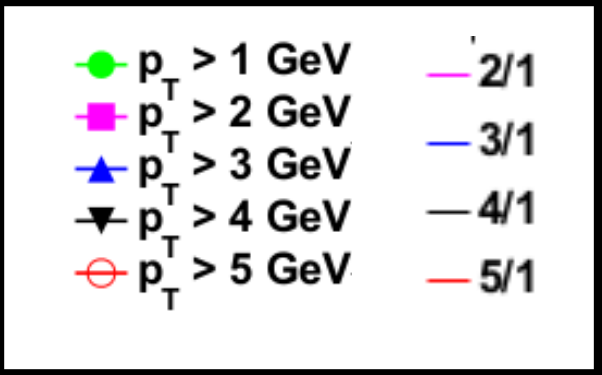


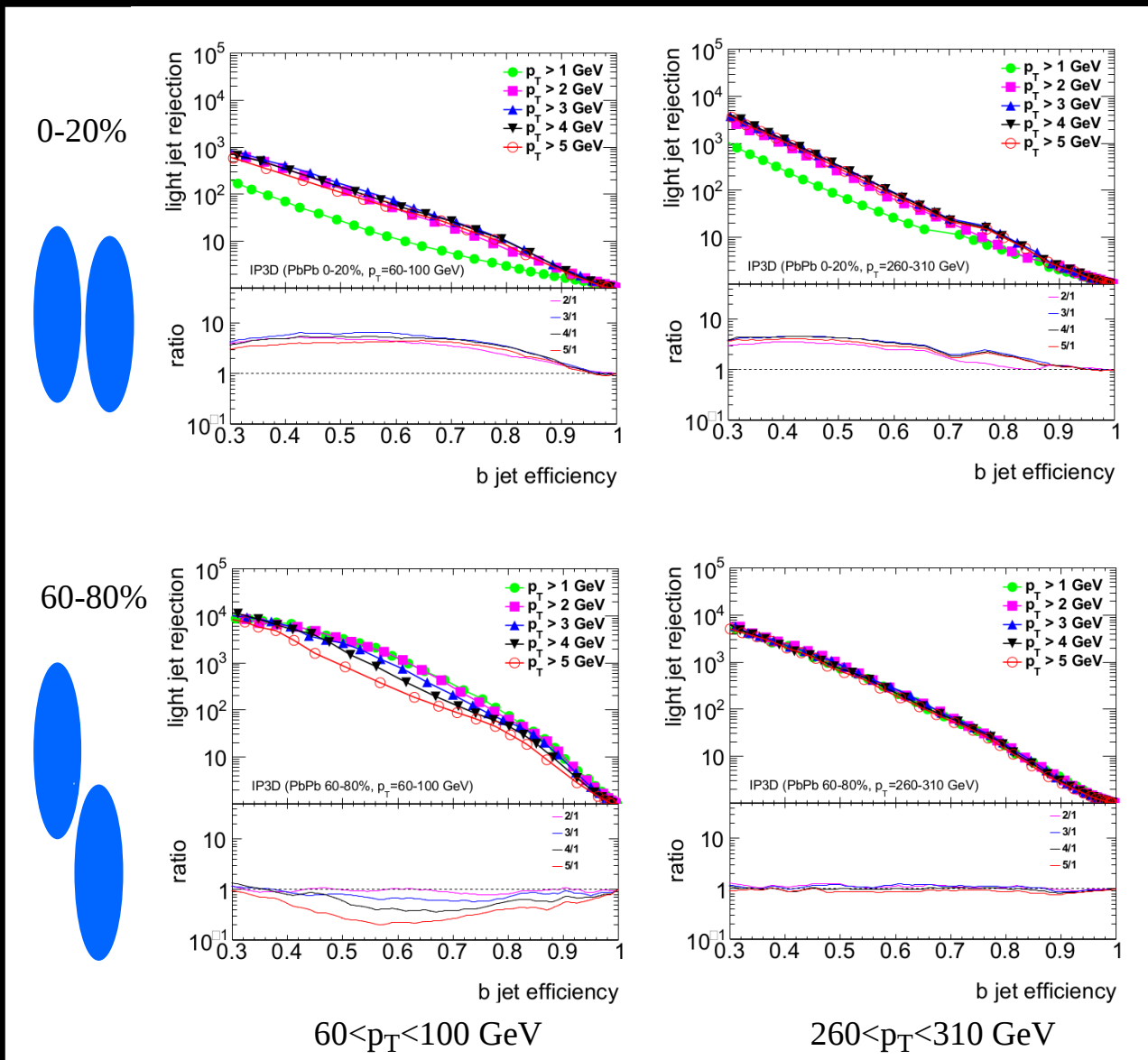
IP3D track p_T cut optimization

Track p_T cut has effect on flavour tagging quality

Major difference in effect between central and peripheral events, and between low and high jet p_T

Best compromise is cut at 2 GeV





HI flavour tagging: current status

B-tagging applied to simulated ATLAS heavy-ion events

- Successful test, but performed on previously reconstructed events
- Algorithms (IP-based, SV-based, high-level) applied in PbPb MC
- Optimization tested on IP-based algorithm

Internal note prepared for the collaboration, public note will follow

B-tagging now being incorporated in standard software chain

- Essential step to start heavy flavour jet analysis in HI collisions
- Tests on real ATLAS HI data will follow

Room for algorithm improvement from HI-specific templates

- Ongoing interaction with members of ATLAS HI, Flavour Tagging groups