

Explore the proton and search for the Higgs: Physics Discussion of the ATLAS W-path

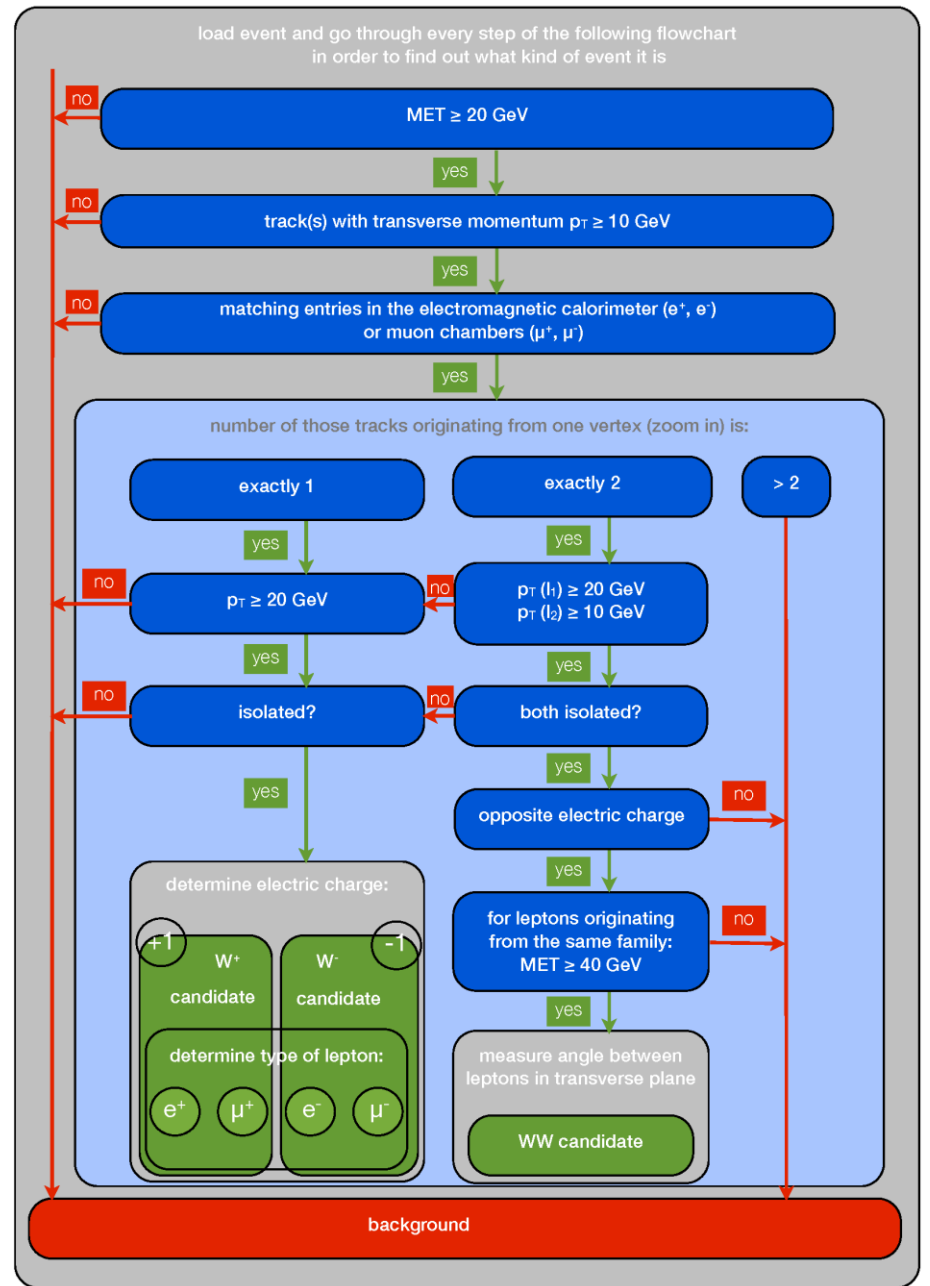


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INTERNATIONAL MASTERCLASSES
2014 - MODERATORS ORIENTATION

Student's tasks 2

Decisions to be made by the students for every single event:



Data samples



- Same as last year:
- 6 data samples à 1000 events (marked 1, 2, ... , 6)
 - each containing 20 sub-samples (marked A, B, ..., T)
 - every pair of students analyses 1 sub-sample à 50 events
- (first step: combination of sub-samples)
- Video-Conference: Combination of all results

The essence 1



1. Report of measurement (15')

Each venue presents:

- measured ratio R_{\pm} of number of W^+ to number of W^- events in W candidate events
- Number of events of found WW candidate events

The only thing you have to do is: Lead through the circulation and share the combined online spread sheet.

The essence 2



2. Combination and discussion of measurement (10')
 - Go to the ATLAS [W-path analysis moderator website](#)
 - Discuss development of R_{\pm} after combination and compare with current ATLAS measurement on the combined online spread sheet, which you will obtain by choosing the current date from the first drop-down menu on the moderator's website
 - Discuss the meaning of that result

The essence 2



2. Combination and discussion of measurement (10')
- Go to the ATLAS [W-path analysis moderator website](#)
 - Discuss development of R_{\pm} after combination and compare with current ATLAS measurement on the combined online spread sheet, which you will obtain by choosing the current date from the first drop-down menu on the moderator's website
 - Discuss the meaning of that result
 - Discuss development of combined histogram, which can be obtained by choosing the current date from the second drop-down menu
 - Discuss selection of events, pre-conditions for claiming a discovery, shape of the angular distribution and current result of this search
 - Discuss difficulties occurred during the measurement

Material



- [Masterclasses schedule](#)
- [Website](#) explaining the measurement
- Moderator's website: [Link](#)
- [W path Guide for tutors](#) (Version 1)
- [\(Version 2 will be uploaded soon here](#) → ATLAS W path)
- [ATLAS paper](#) : Measurement of the $W \rightarrow lv$ and $Z/\gamma^* \rightarrow ll$ production cross sections in proton-proton collisions at $\sqrt{s} = 7$ TeV with the ATLAS detector
- [ATLAS Conf Note](#) : Search for the Standard Model Higgs boson in the $H \rightarrow WW \rightarrow ll\nu\nu$ decay mode using 1.7 fb⁻¹ of data collected with the ATLAS detector at $\sqrt{s} = 7$ TeV

Enjoy your Masterclass!

