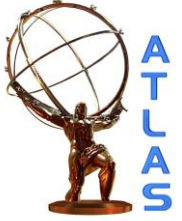


INTERNATIONAL MASTERCLASSES HANDS ON PARTICLE PHYSICS

Neue Messungen für 2012

Workshop Netzwerk Teilchenwelt
10.12.2011 Uta Bilow, TU Dresden



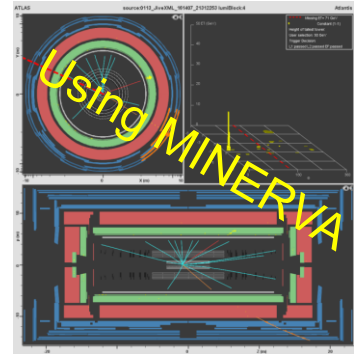


ATLAS W-Pfad

- 995 *real data* preselected events ($\sim 200 W \rightarrow \ell n$)
- W charge asymmetry \rightarrow structure of the proton
- 5 *simulated* $H \rightarrow WW$ \rightarrow search for yet undiscovered

Plans for 2012:

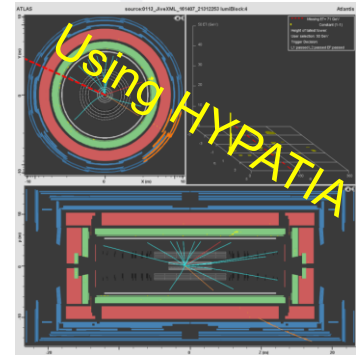
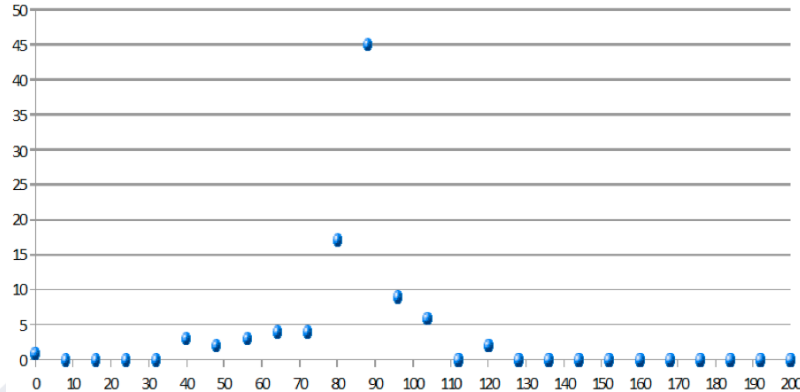
- 6 000 *real data* preselected events ($\sim 2000 W \rightarrow \ell n$)
- different set of data for each institute, can be compared for consistency and combined in the video conference.
- include 250 $WW + 0$ jets (MC data)
- students measure opening angle between 2 leptons and combine their results in histogram for angular distribution





ATLAS Z-Pfad

- 700 *real data* preselected events ($\sim 300 Z \rightarrow \ell\ell$)
- Find Dilepton events \rightarrow calculate invariant mass
- 300 *simulated* $Z' \rightarrow \ell\ell$ \rightarrow search for yet undiscovered
- Derive mass spectrum



- Discuss importance of invariant mass concept
- Discuss meaning of finite width
- Discuss meaning of new mass peaks (Z' , not shown above)

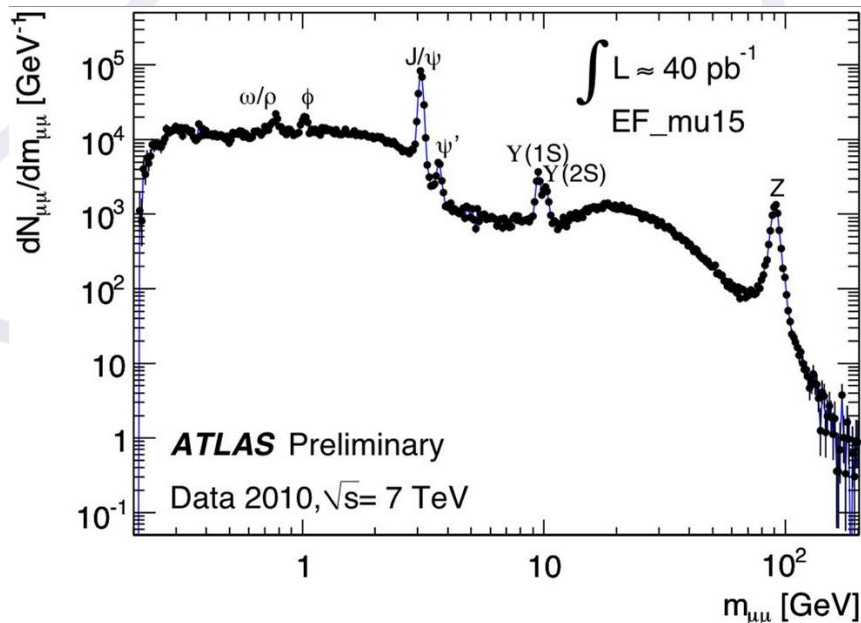


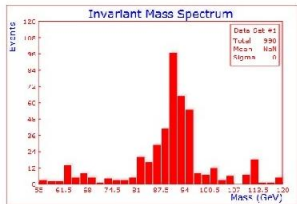
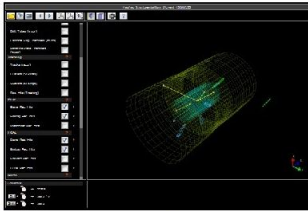


ATLAS Z-Pfad

Plans for 2012:

- larger data sample
- Also J/Psi and Upsilon
- Identify search for dilepton events
- php tool for mass plots under development





W/Z Messung

- 1900 Events:
 - W and Z
 - Background
 - “Mystery” events 2-12 GeV
- Students sort events by:
 - Lepton flavor (e or μ)
 - Candidacy (W or Z)
 - Charge (W⁺ or W⁻)
- Find:
 - W⁺/W⁻
 - e/ μ
 - Z mass
 - W/Z (challenge)



CMS



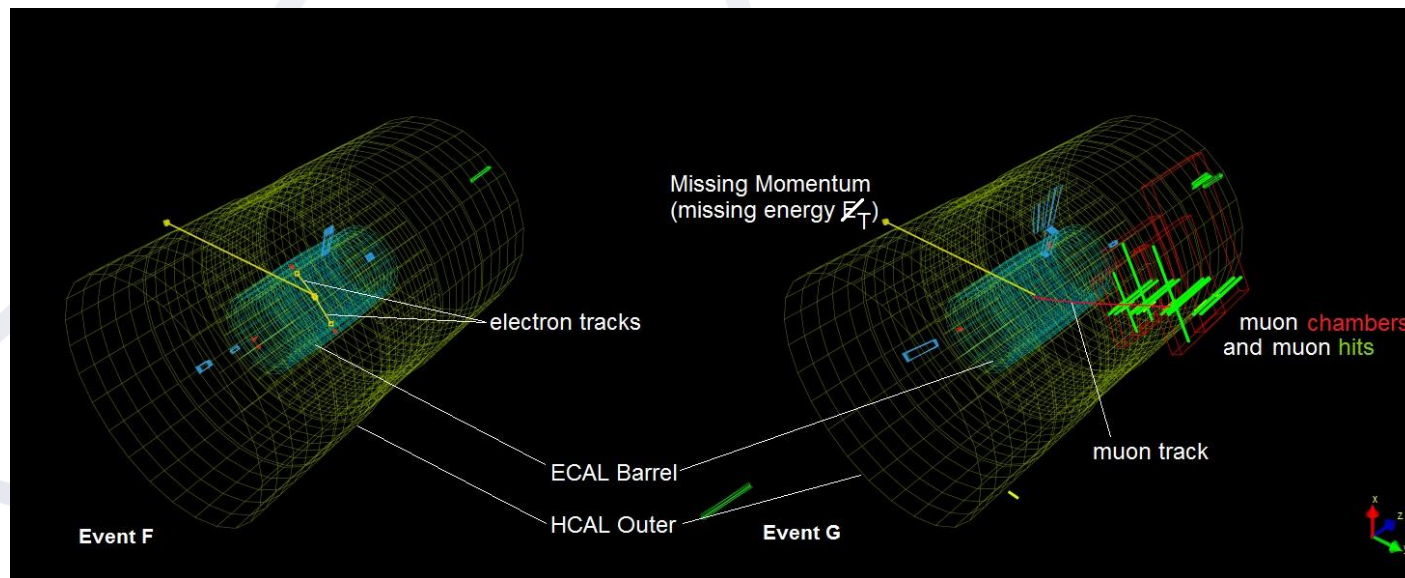
iSpy online

New Features for W/Z:

- Missing Et vector
 - And slider

- Changes in controls

- Numbers of objects – gone
- Electron tracks moved



ALICE

Looking for strange particles in ALICE

- physics motivation
- Strangeness enhancement : (first) signature for quark gluon plasma

The signature

- V0 (and cascade) decays of strange hadrons (K_0^0 s, Λ , Ξ^-)

The tools

- Simplified ALICE event display based on ROOT
- Combine visual analysis of small event sample with large statistics analysis

The data

- First LHC data (900 GeV proton proton) : develop / run masterclasses 2011
- 7 TeV proton proton data for 2012
- Pb-Pb collision data : in a next version



ALICE

- New in 2012: 2nd part of exercise (GSI version)
- Analyse big event sample (2000 events)
- Invariant mass histograms for Ks, Lambda, anti-Lambda
- Fit 2nd degree polynomial to background
- Fit gaussian to peak
- Get number of Ks, Lambda, anti-Lambda after background subtraction

