

Introduction to World Wide Data Day

<http://tiny.cc/w2d2>

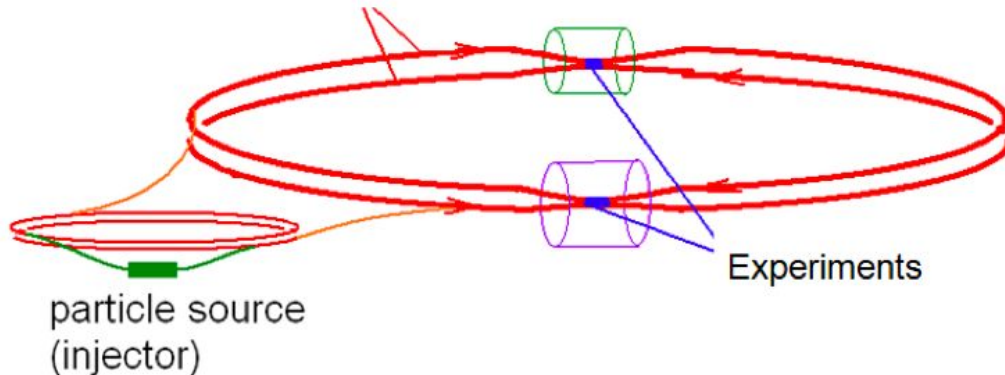


What is the LHC and what happens there?

LHC=Large Hadron Collider

- ~100 m underground near Geneva, collides protons
- Most energetic accelerator in the world (currently 13 TeV)

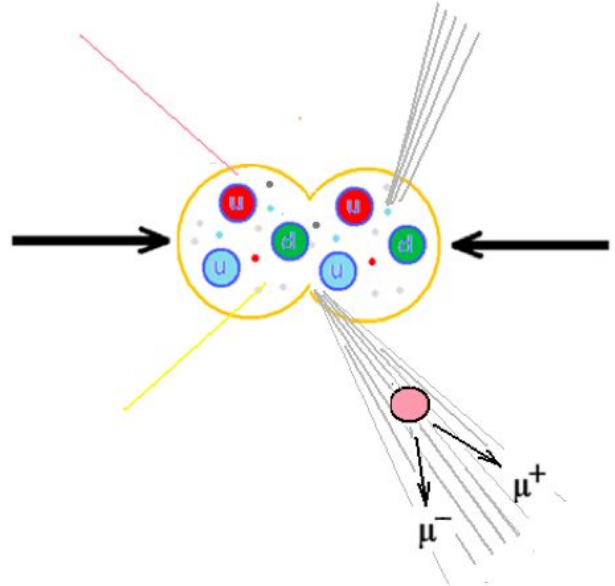
beams accelerated in large rings
(27 km circumference at CERN)



What is the LHC and what happens there?

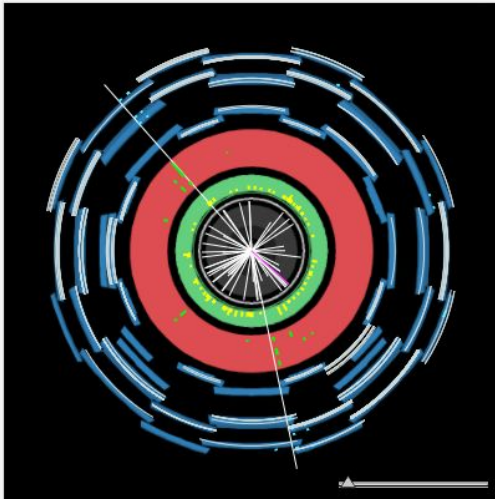
When protons collide...

- Many particles are produced due to $E=mc^2$ (13 TeV \rightarrow particles)
- Most are known processes: background
- What we are looking for:
 - Relatively massive particles produced
 - Decay promptly
 - Muon and anti-muon (or “dimuons”)
 - A muon is the heavier cousin of the electron

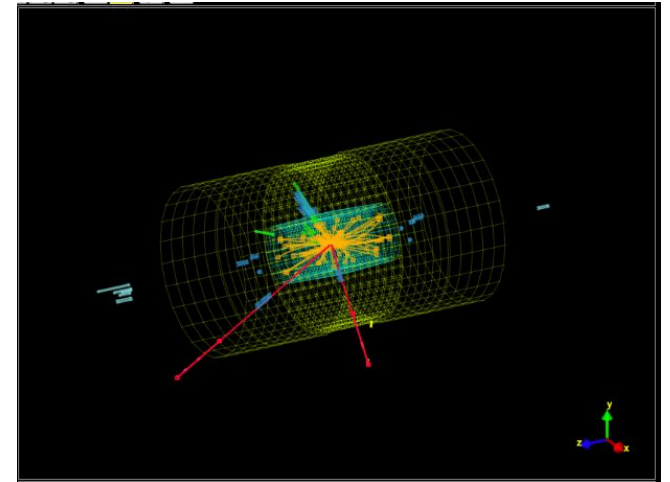
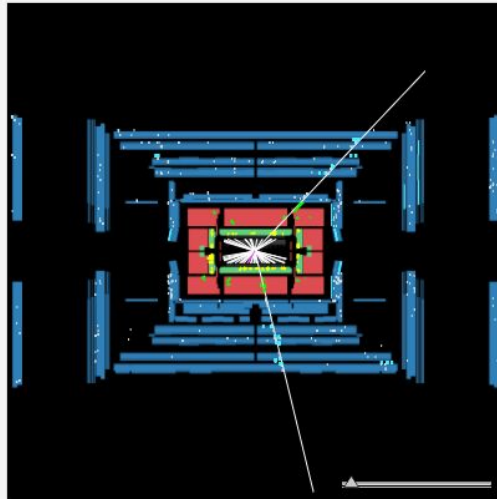


Dimuons look like one of these

- 2 long tracks
- Any other things in event are background - ignore
- If not 2 muons in event, entire event is background - ignore

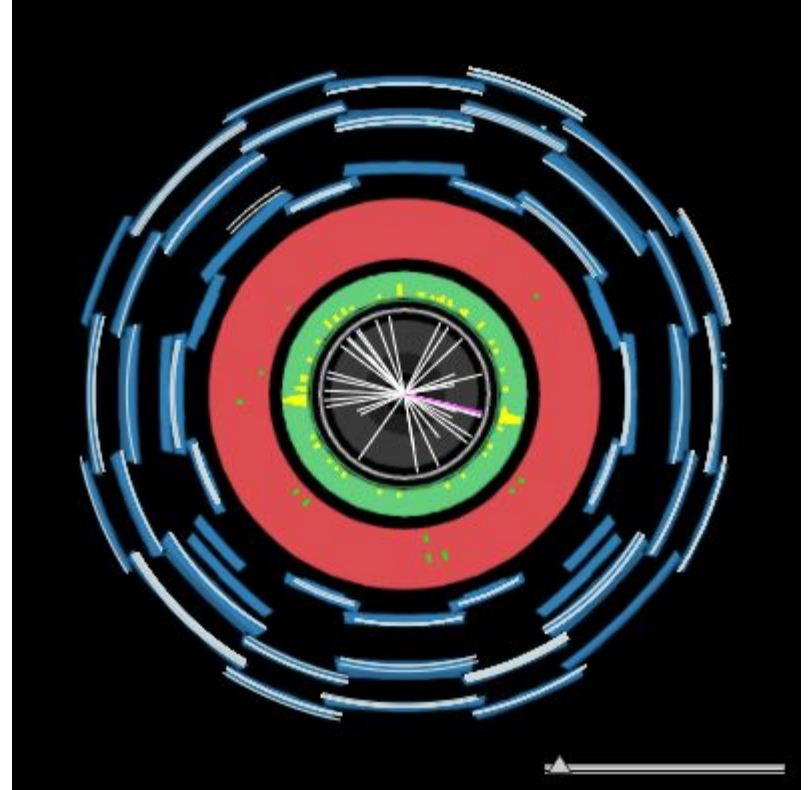
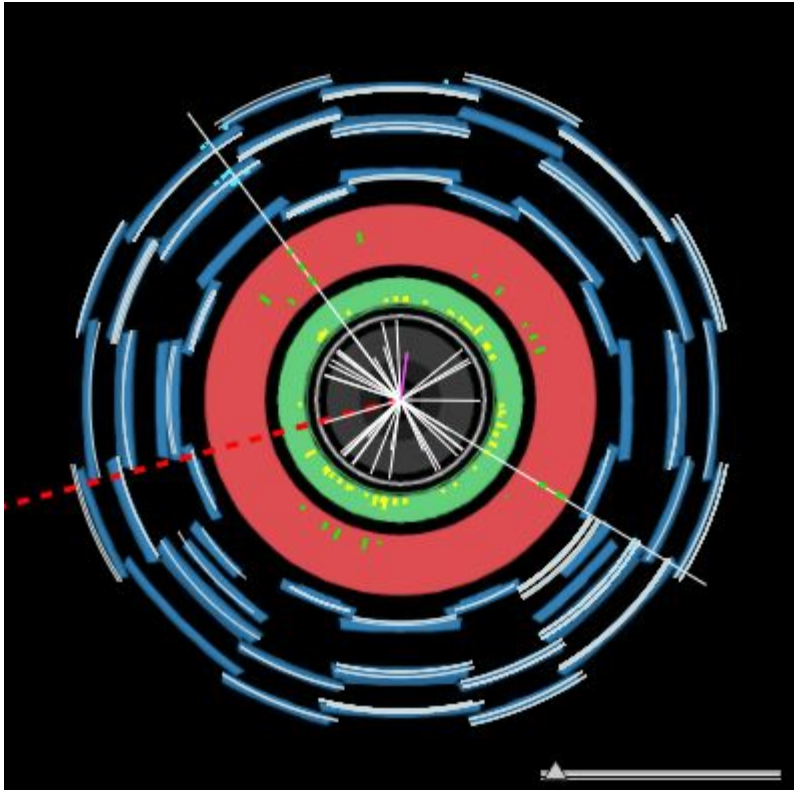


Dimuon in ATLAS

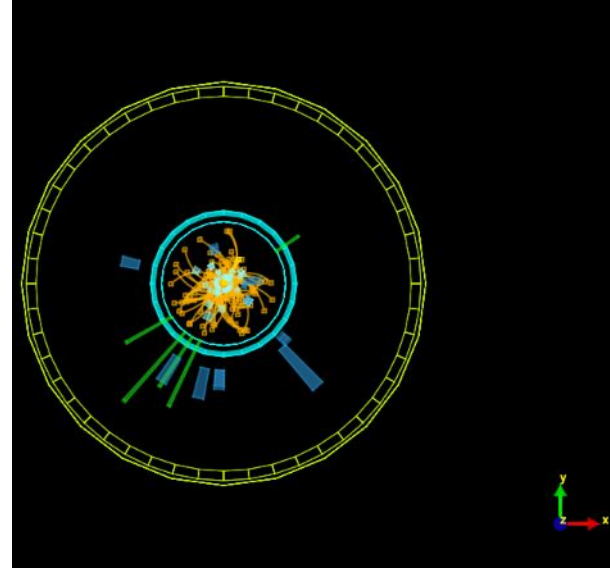
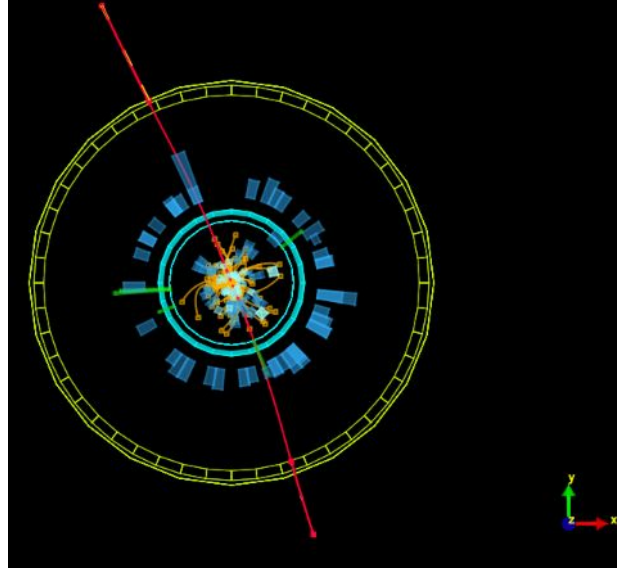
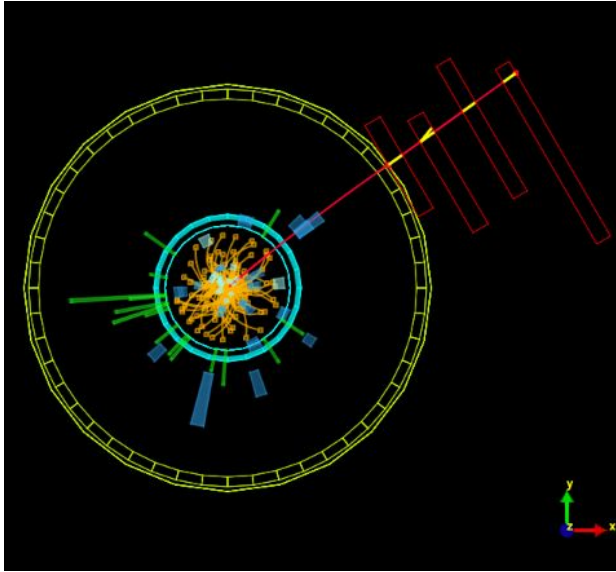


Dimuon in CMS - muons coded red

Dimuon or background? (ATLAS)



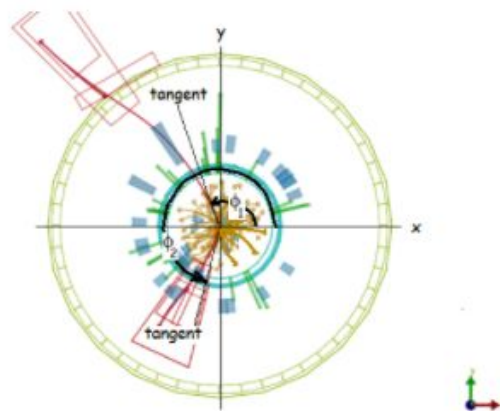
Dimuon or background? (CMS)



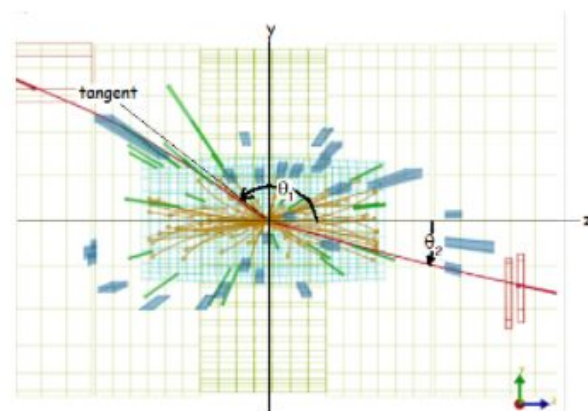
Ready?

Make use of:

- ATLAS or CMS page for W2D2
- Screencast
- Event display
- Tally sheet



Finding angle Φ for the upper muon in the x-y view.



Finding angles θ_1 for the upper muon and θ_2 for the lower muon in the z-y view.

Ready?

Form up:

- Partners - 2 to a computer
- Each pair takes one set of 50 events (ATLAS) or one set of 100 events (CMS)
- Fill out tally sheet - turn in
- Make class histograms!
- Ask questions!

