Paper: Muon reconstruction performance of the ATLAS detector in proton-proton collision data at sqrt(s)=13 TeV (https://arxiv.org/abs/1603.05598**)**

Questions:

Session 1 (Feb. 5)
- How are muons reconstructed?
- What do we gain if we could make MS thicker/add more layers?
    - How many hits does a typical muon leave in the MS as it is?
- How does tracking change for muons to electrons?
- How do the different components of the MS actually work (RPC, TGC, MDT, CSC etc)?
- Why are muons so penetrating?
- (Qualish type question: Why do charged pions mostly decay to muons? (they talk about this being a background))
- What directions are magnetic fields in barrel, MS and endcaps? Why do we use different subsystems in MS and endcaps i.e. MDTs in barrel vs. CSC in endcap
- Could you find the higgs using only the MS?

Session 2 (Feb. 12)
- What processes affect pT? At which energy do these processes dominate?
- How do we calculate efficiencies?
- What is the tag-and-probe method?
- How much efficiency did we gain after last upgrade?
- Why do we use different samples for momentum and efficiency?
- In figure 8, why is there a drop in efficiency for pT 50-80 GeV?
- Why do we use different techniques for reconstructing tracks in the ID vs MS?
- Why do we take measurements when the toroid is off?
- For the muon corrections, what direction is being probed? Perpendicular to magnetic field in the MS.

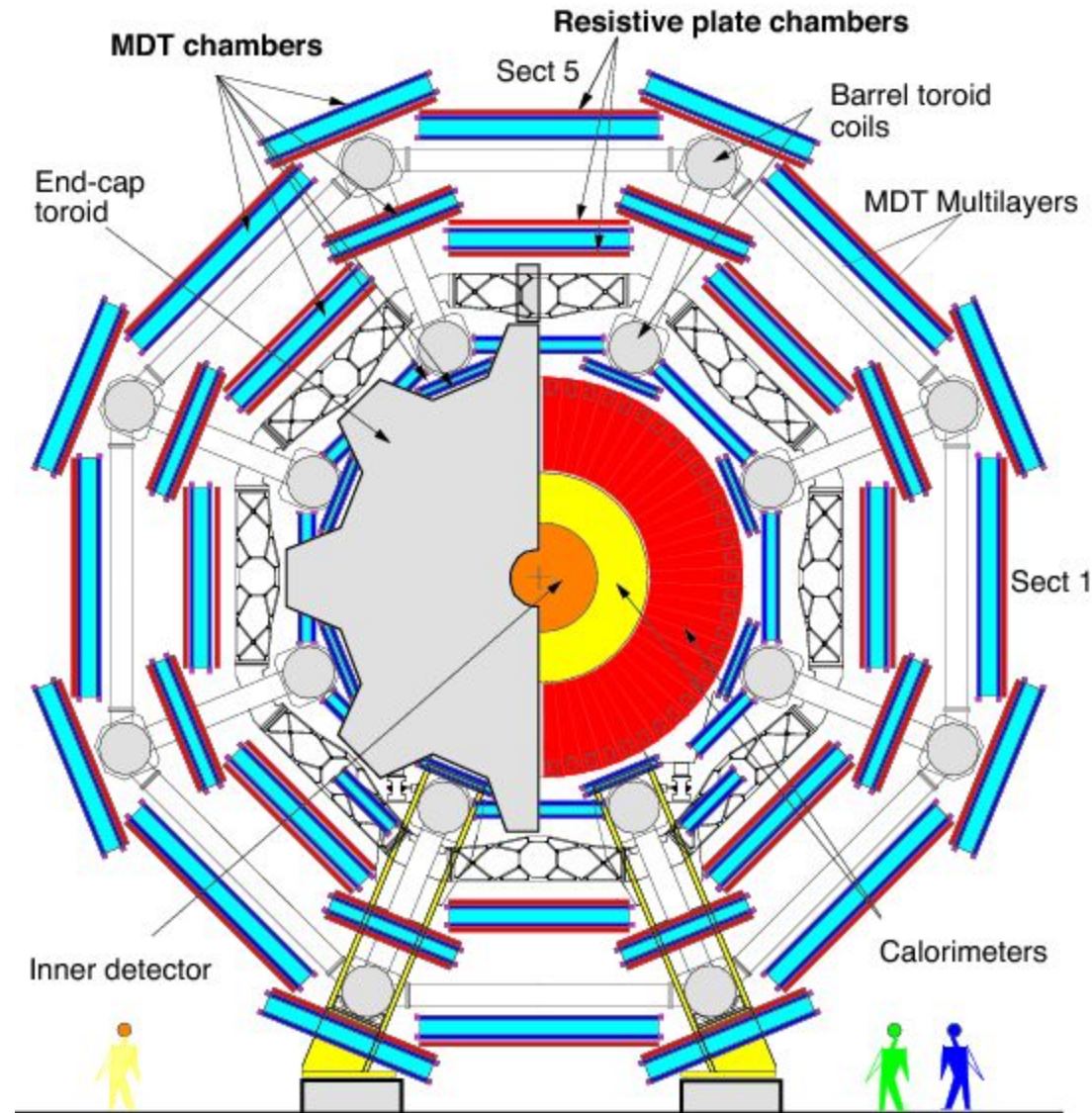*answered during session. See meeting notes.
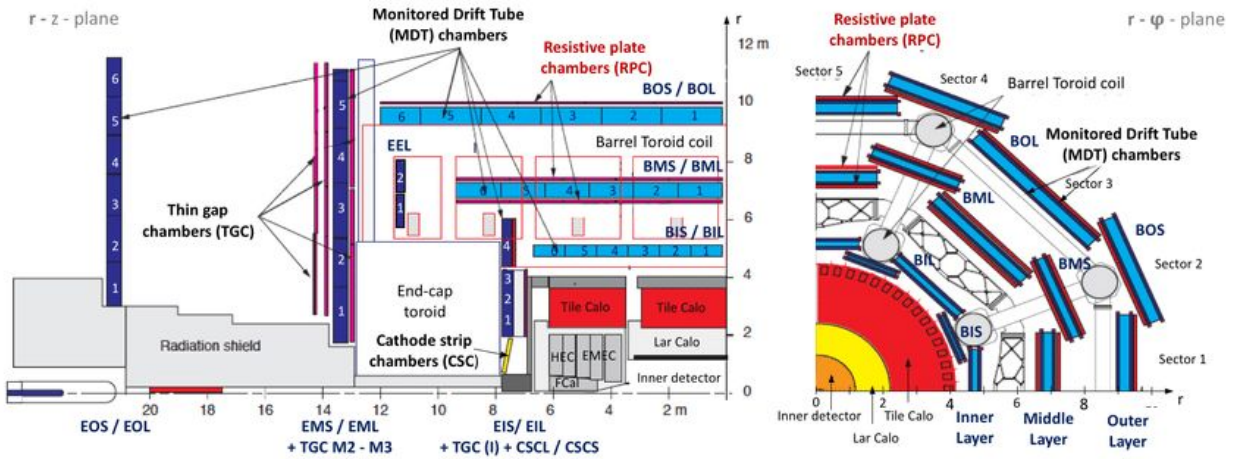
Resources:
Muon Presentation from ATLAS Software Tutorial
(https://indico.cern.ch/event/772589/contributions/3210521/attachments/1786587/2909011/mpi-beamer-template.pdf)
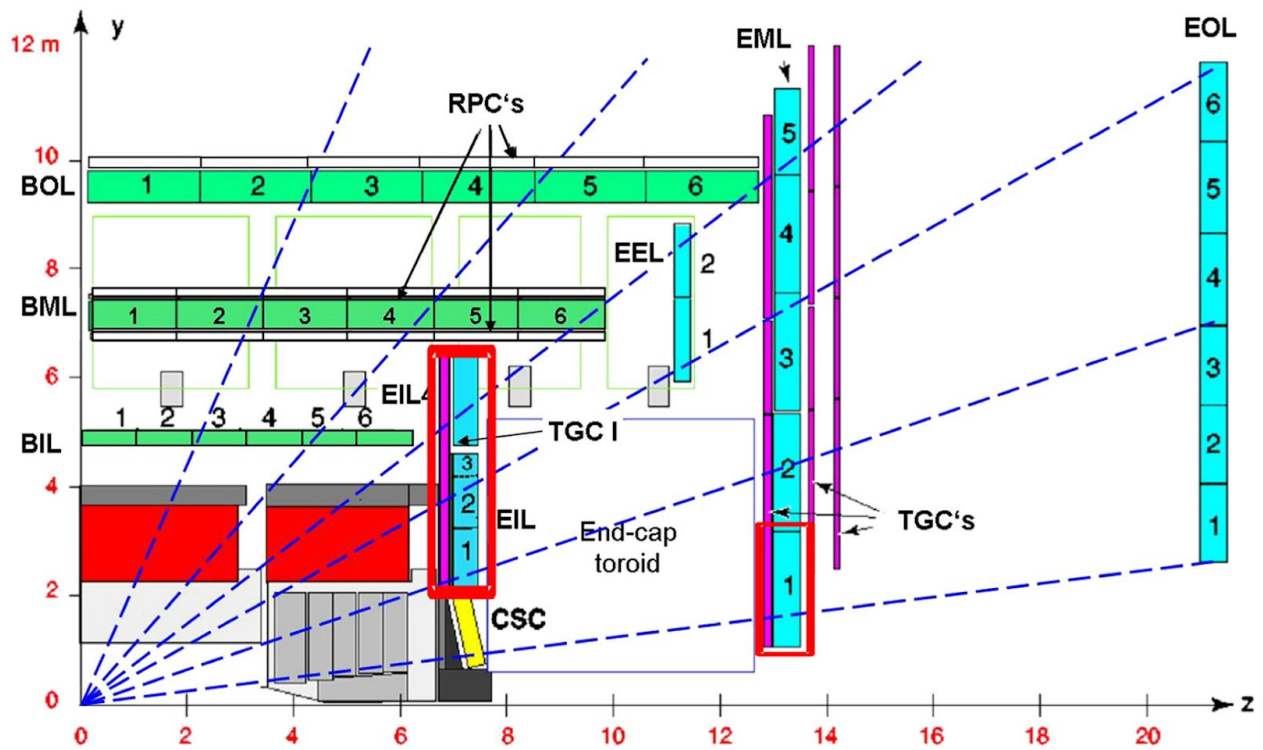
List of Muon Public Results (https://twiki.cern.ch/twiki/bin/view/AtlasPublic/MuonPublicResults)

Muon Spectrometer TDR
(http://atlas.web.cern.ch/Atlas/GROUPS/MUON/TDR/pdf_final/mTDR.pdf)

Cross-Section of Muon Spectrometer (https://cds.cern.ch/record/1275998/plots)

Cross-section of Muon Spectrometer
(https://www.researchgate.net/figure/Cross-section-of-a-quadrant-of-the-ATLAS-Muon-Spectrometer-in-the-r-z-plane-left-and_fig86_318981598)
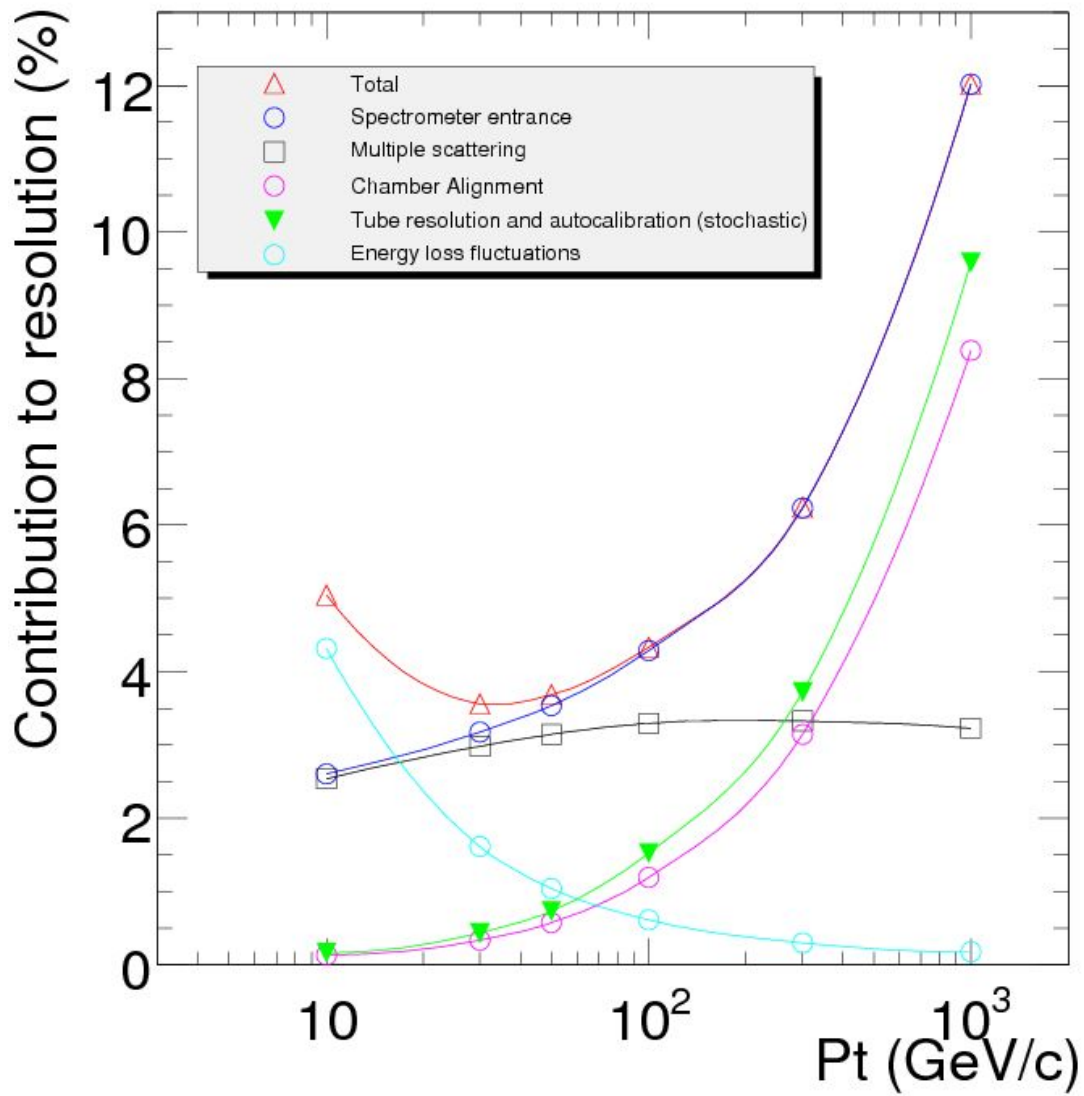

Muon spectrometer [Figure 1]
(https://www.sciencedirect.com/science/article/pii/S0168900213000703#f0005)

Previous Muon Reconstruction Performance Paper [2011-2012].
(https://arxiv.org/pdf/1407.3935.pdf)

Muon Performance Public Papers
(https://twiki.cern.ch/twiki/bin/view/AtlasPublic/MuonPublicResults)

Muon Performance Public Plots
(https://twiki.cern.ch/twiki/bin/view/AtlasPublic/MuonPerformancePublicPlots)

Muon Combined Performance Public Plots
(https://twiki.cern.ch/twiki/bin/view/AtlasPublic/MuonPerformancePublicPlotsOld)

Contributions to resolution vs pT. [Figure 4]
(https://twiki.cern.ch/twiki/bin/view/AtlasPublic/MuonPerformancePublicPlotsSimulation)

ATLAS Material Distribution [Last slide] (https://slideplayer.com/slide/14807374/)