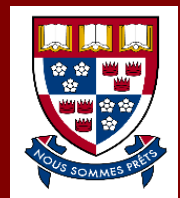




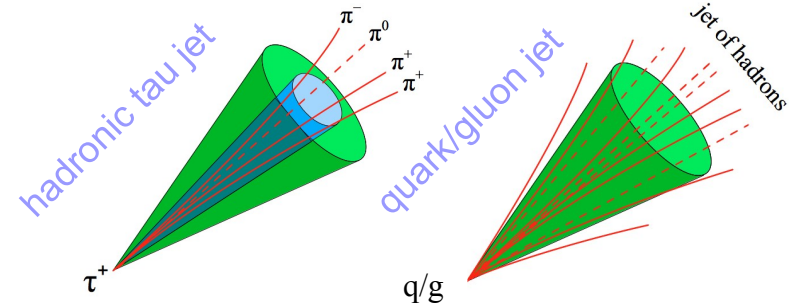
The ATLAS hadronic tau trigger

Andres J. Tanasijczuk (Simon Fraser University, Canada)
on behalf of the ATLAS Collaboration

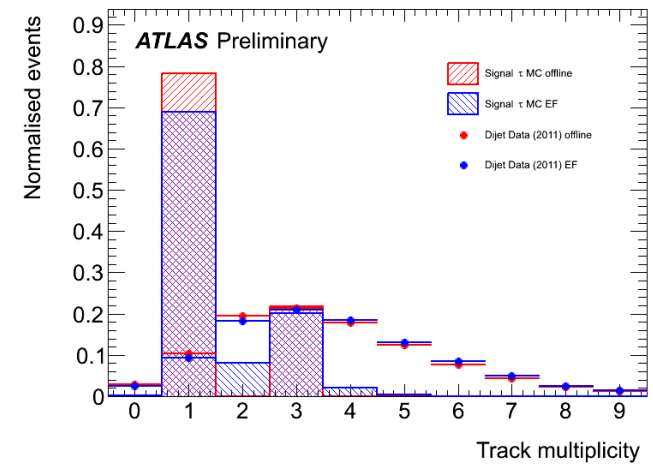
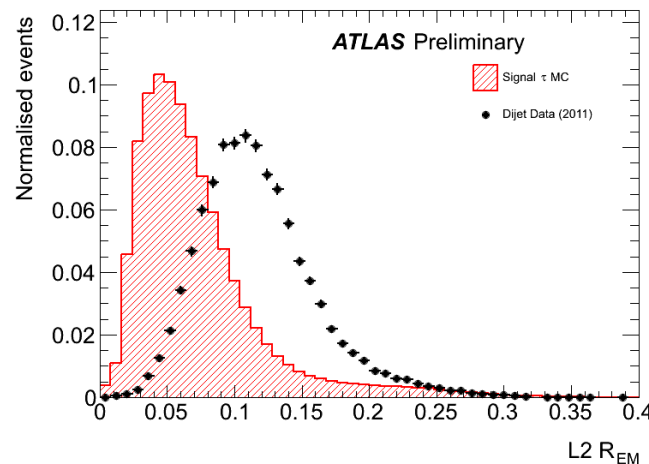


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- **Goal:** efficiently identify hadronic tau decays at trigger level while keeping high rejection of overwhelming QCD background
- Hadronic tau decays distinguished from QCD jets by:
 - ▶ **low track multiplicity**
 - ▶ **narrowness** (exploit **isolation**)
- ATLAS trigger has three levels of increasing data analysis complexity



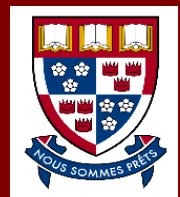
- Identification of Regions of Interest in the calorimeter (EM+HAD)
- Transverse energy (E_T) threshold
- Isolation criteria for high rate triggers
- Fast track reconstruction
- Exploit shower shape variables (e.g. EM-radius)
- E_T parametrized selection using similar shower shape variables as offline ID (simple cuts (2011) and multivariate (2012))





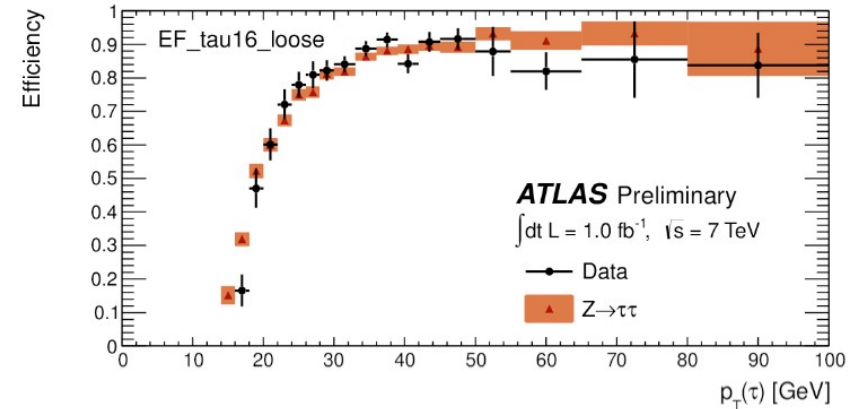
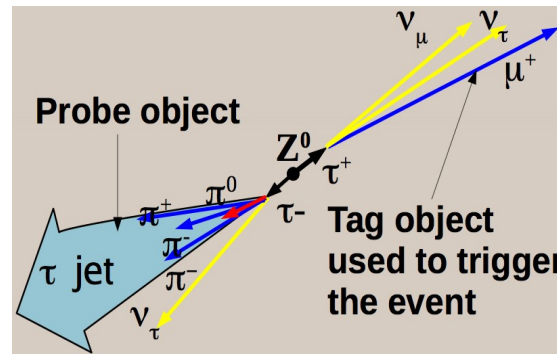
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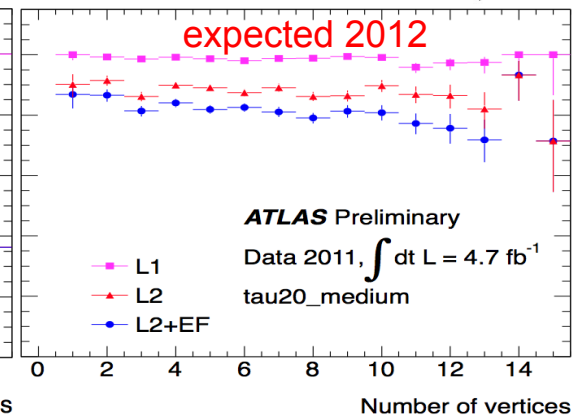
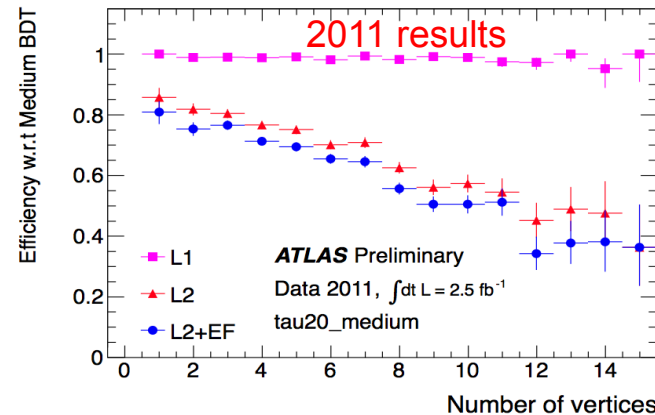


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- Efficiency measured using **tag and probe** methods:



- Efficiency drop with high number of additional interactions
- Improvements for 2012 robustness against additional interactions => expected 2012 efficiency flat vs. number of primary vertices



- To reduce rates hadronic tau triggers are usually combined with other signature triggers (e.g. e, μ)

