

Online/Offline Data Quality Monitoring for Dileptonic Top Events

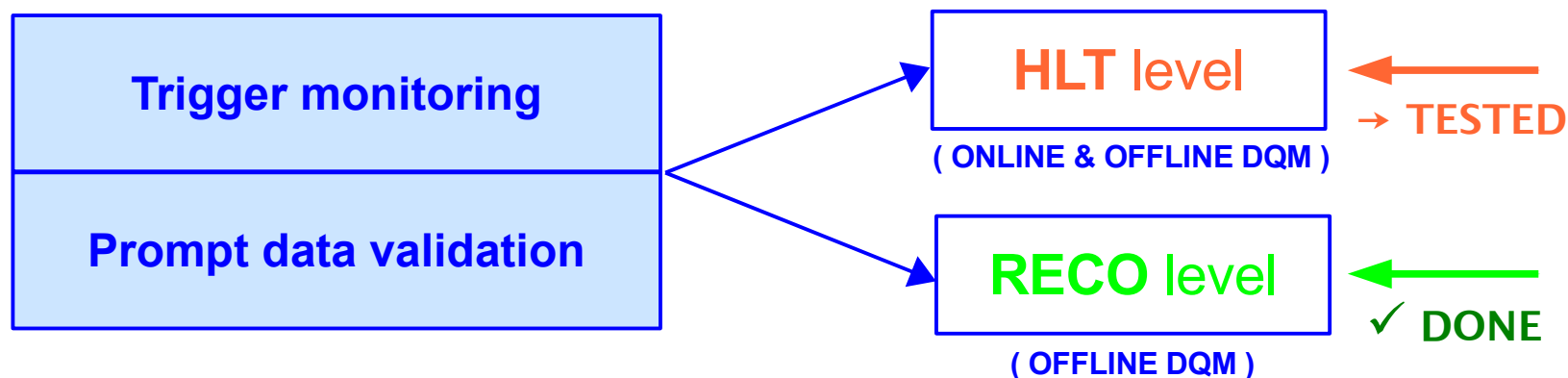
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- Top-specific **event topology**: single/double leptons + multiple jets.
- High- p_T leptons (muons & electrons) → **top-like selection cuts**.
- Run-by-run monitoring of quality and stability of **signal rates**.



- ✗ Not sufficient event statistics for top-dilepton monitoring in early data.
- Monitoring of dimuons at **RECO** (Offline) and **HLT** (Online & Offline) level.
- Need O ($0.1-1 \text{ pb}^{-1}$) for visible J/ψ -peak (900 GeV) or Z-peak ($\gtrsim 2 \text{ TeV}$).

Talk by M. Felcini at Top.Com09 Workshop



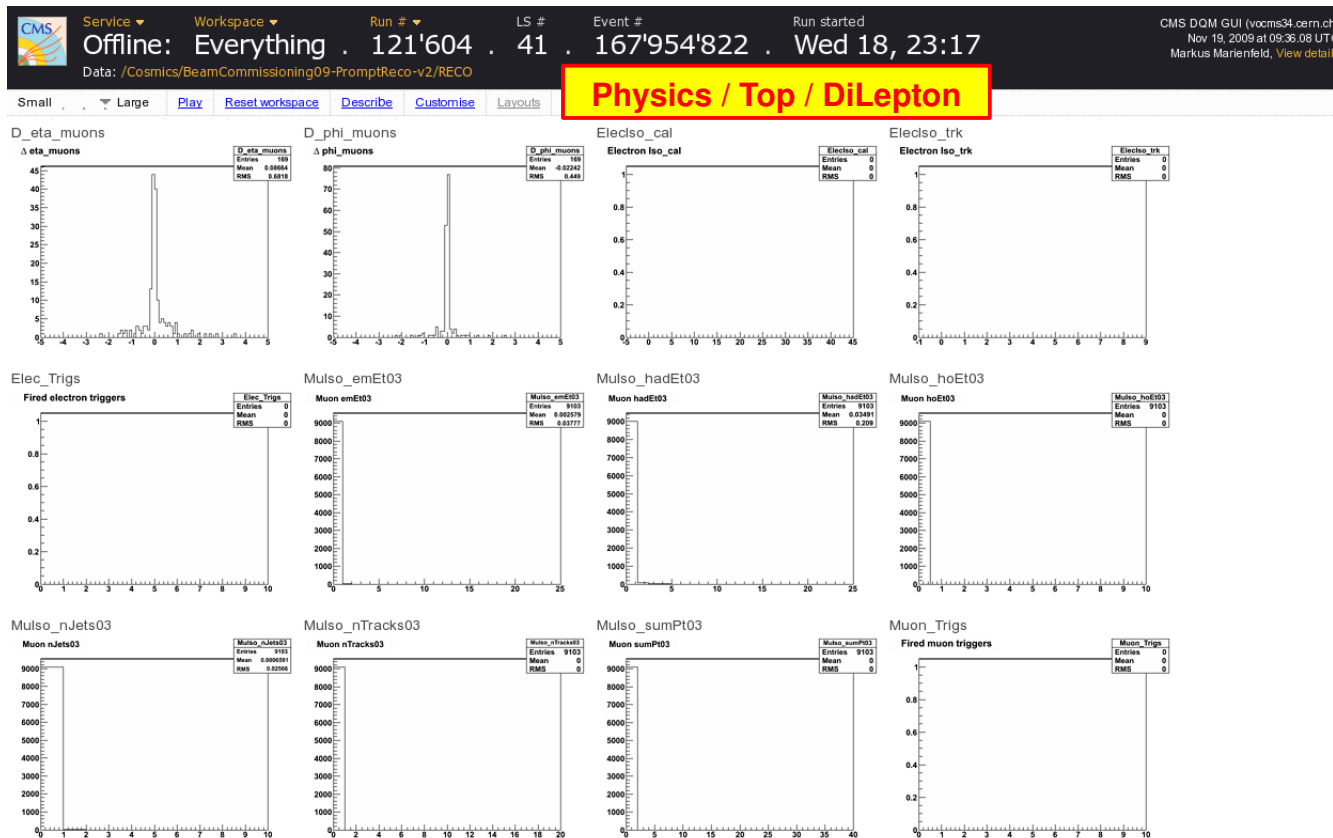
4. Action List & Manpower Needs (I)

1. Prompt Trigger Efficiency Measurement & Data Validation (PV) in DQM/CAF Work to be done in collaboration with TSG, DQM, POGs, PVT			
Top-like Final state	Trigger to be validated	Method for PV Studies / DQM implementation	Who is interested
Muon-plus-four-jets	HLT_Mu9(15)	YES / In progress	J. Cuevas, K. Lannon, M.F., P. Lobelle, J. Staunwhite
Electron-plus-four-jets	HLT_E1e20_SW_L1R	Ideas (need consolidation) / NO	Volunteers needed
Di-muon-plus-two-jets	HLT_Mu9(15) HLT_DoubleMu3	In progress / In progress	M. Marienfeld, A. Geiser, D. Dammann
Mu-E1e-plus-two-jets	HLT_Mu9(15)	In progress / In progress	M. Marienfeld, A. Geiser, D. Dammann
Di-electron-plus-two-jets	HLT_E1e20_SW_L1R	Ideas (need consolidation) / NO	Volunteers needed
Multi-jets	HLT_QuadJet	Ideas (need consolidation) / NO	Volunteers needed



➤ Status of prompt data validation:

- Monitoring of dilepton reconstruction & trigger efficiencies at **RECO** level and **HLT** level for simple physics feedback (→ dilepton mass spectrum).
- Running within **Offline DQM** sequence since **October 2009!**



Running since
October 2009 !

- ✓ Successfully working in Offline DQM sequence.
- ✓ First update submitted.

Offline prompt trigger validation

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Markus Marienfeld (DESY)

► Input: $\geq 1 \text{ RECO::Muon} \ \&\& \ \geq 1 \text{ RECO::GsfElectron}$

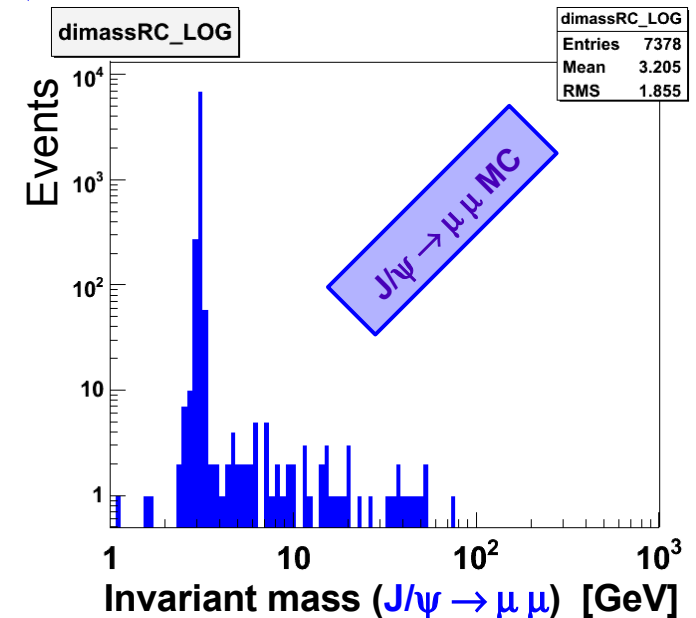
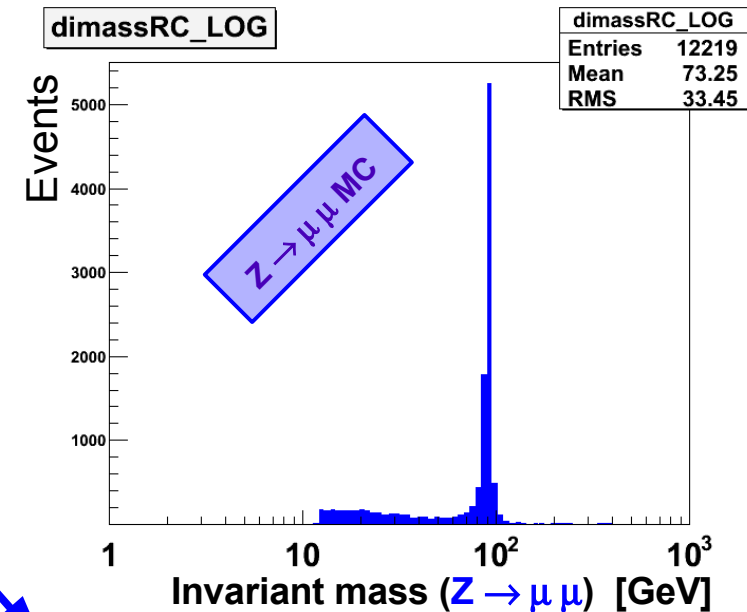
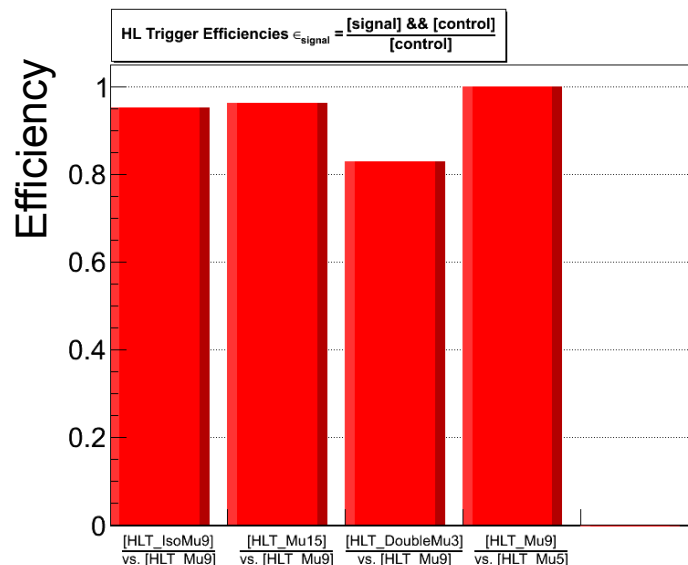
❶ $\Sigma \text{ Leptons} \geq 2$

❷ Isolation cut $\oplus$ control trigger (μ)

❸ Inv. mass cut $\oplus$ charge cut (RC)

► Monitoring: $p_{\perp}(\mu, e)$, $\eta(\mu, e)$, ... $\Delta\eta(\ell, \ell')$, ...

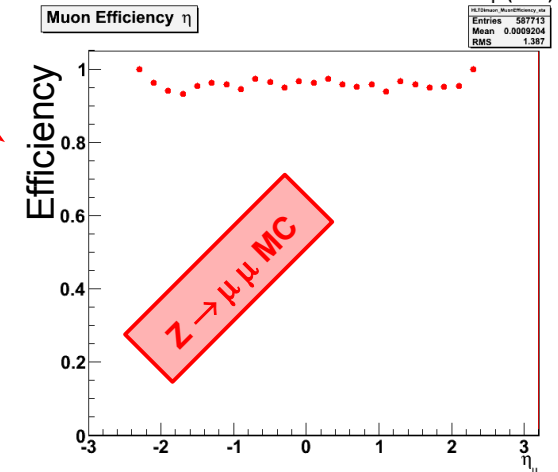
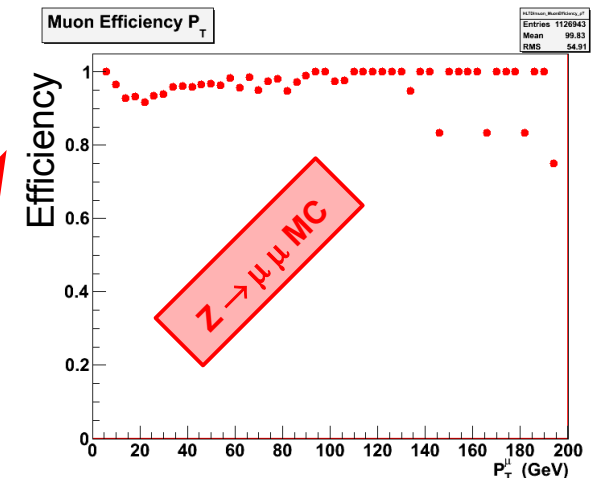
► Trigger validation:
$$\epsilon_{\text{sig}} = \frac{[\text{signal}] \ \&\& \ [\text{control}]}{[\text{control}]}$$



➤ Plans for prompt trigger monitoring:

- **Online/Offline** monitoring and checks of **lepton trigger efficiencies** from dileptonic top-like events at **HLT level** ('tag & probe' approach).

Test implementation



Online/offline trigger monitoring

Markus Marienfeld (DESY)

► Input: L1/L3 muon collection (≥ 2 muons)

① Control triggers:

900 GeV (J/ψ)	≥ 2 TeV (Z)
HLT_Mu3	HLT_Mu9 / HLT_Mu15

② Muon isolation cut

③ Inv. mass cut $\oplus$ charge cut (RC)

► Monitoring plots:

$m_{\text{inv}}(\mu, \mu)$, $p_{\perp}$, η , ϕ , ... $\Delta\eta$, $\Delta\phi$, ...

► Trigger validation:

$$\epsilon_{\text{sig}} = \frac{[\text{signal}] \ \&\& \ [\text{control}]}{[\text{control}]}$$

Signal triggers:	Mu9, Mu15, DoubleMu3
Control triggers:	Mu3, Mu9, Mu15

