

Status of Muon Selection Optimization

21-10-2015

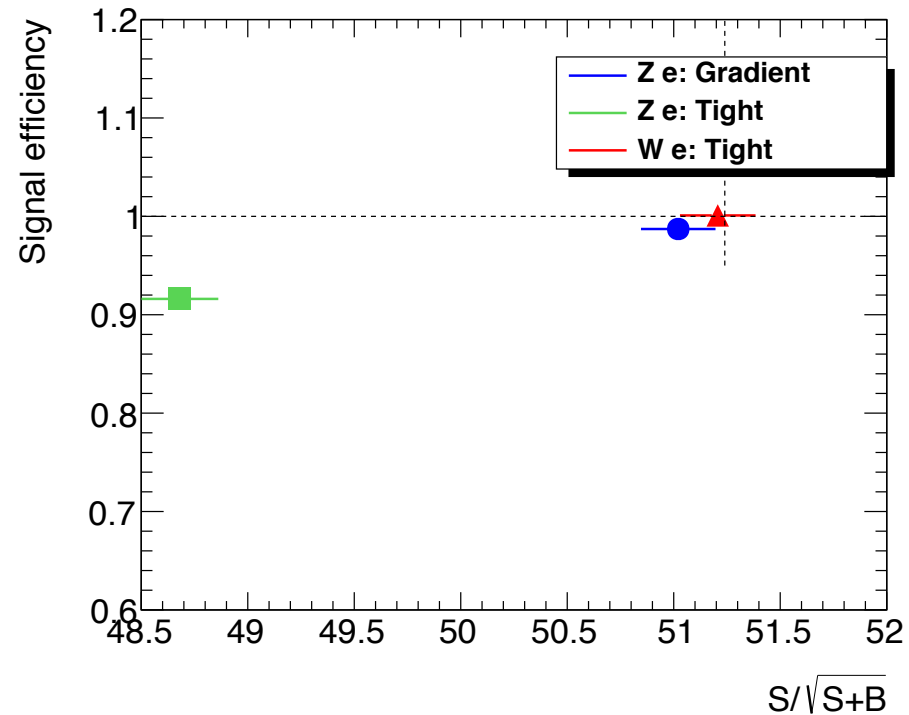
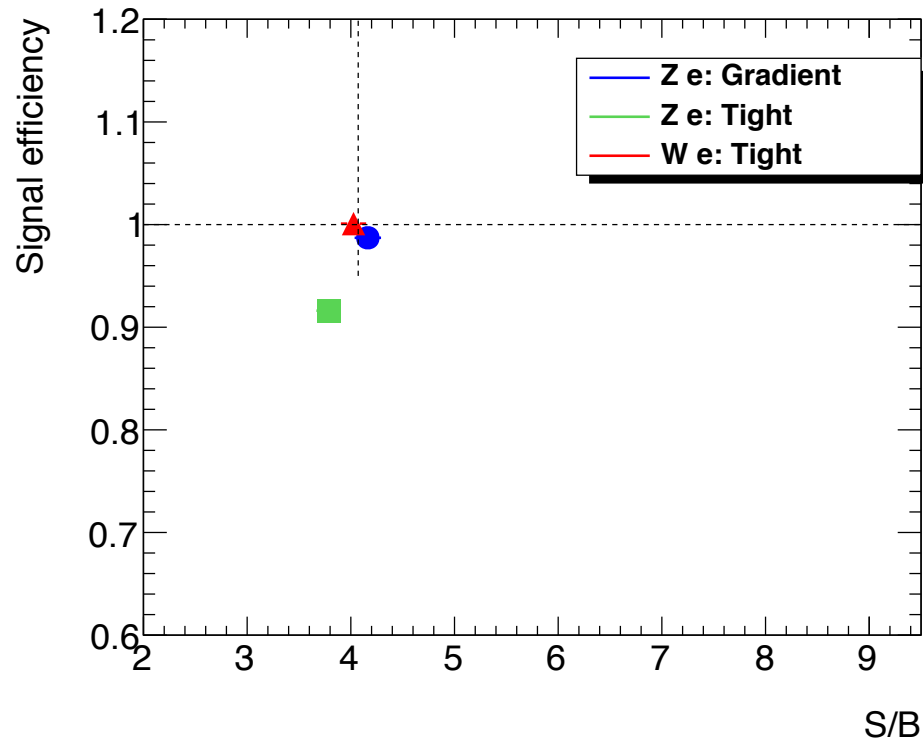
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LAPP, AUTH

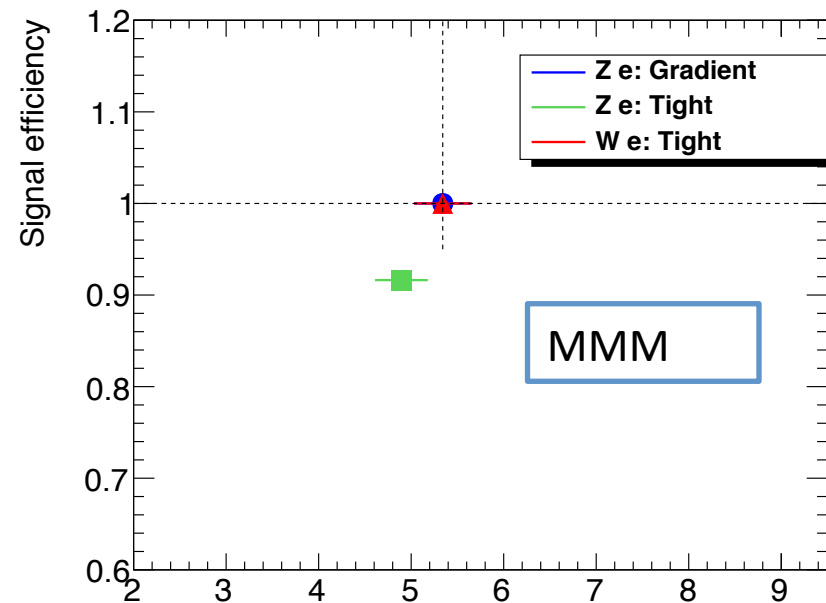
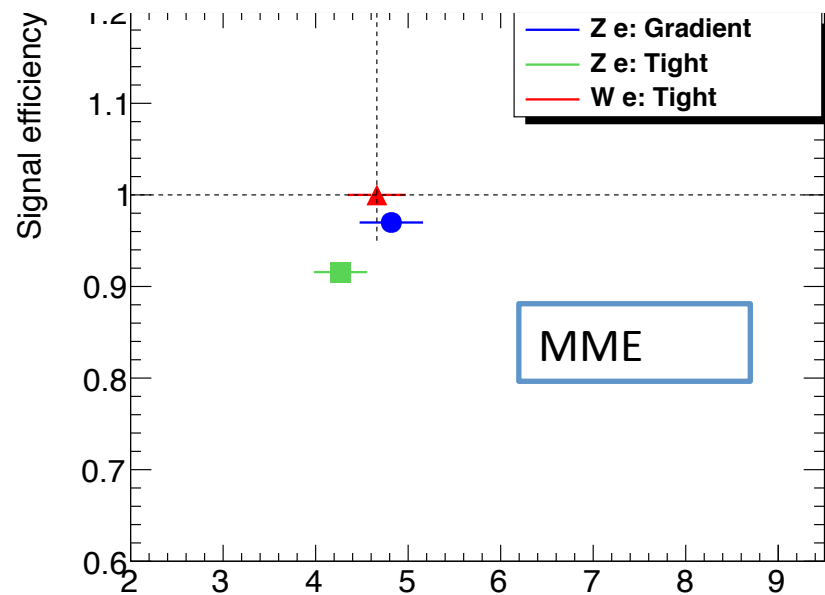
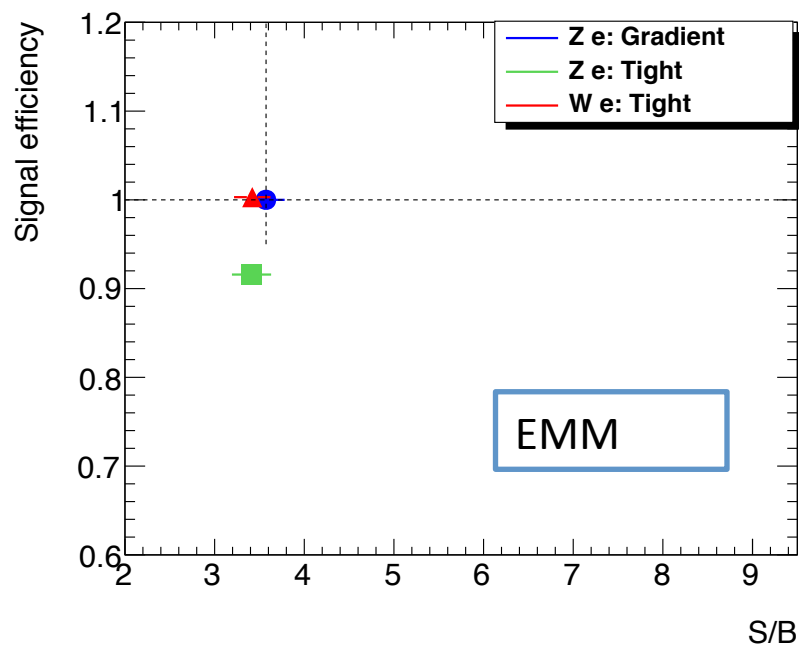
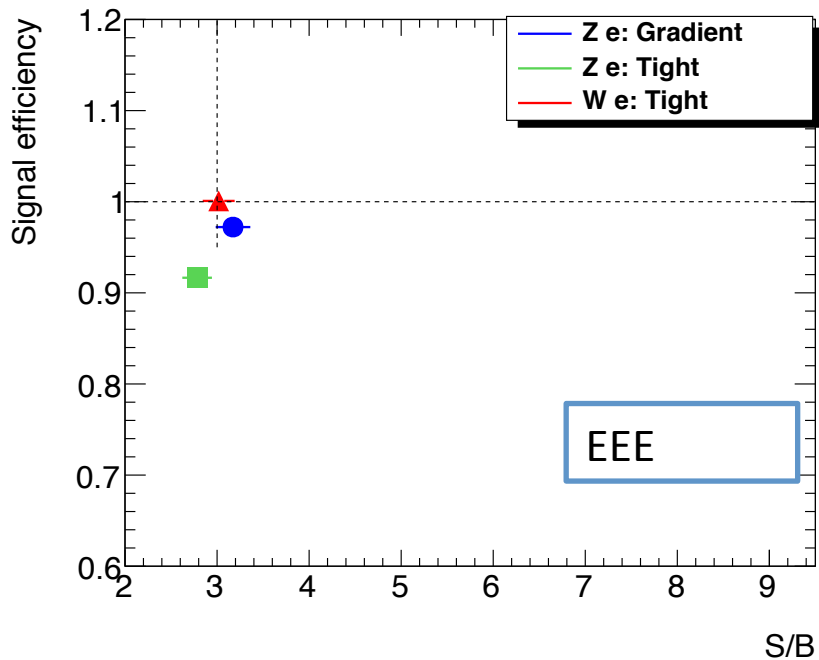
Electrons Isolation Optimization

- Isolation: tighten the isolation cuts → increase the signal efficiency while reducing the background
- Current Isolation selection for the electrons:
 - Z electrons: GradientLoose (→ Gradient, Tight)
 - W electron: Gradient(→ Tight)
- Each time change only one of the two cuts

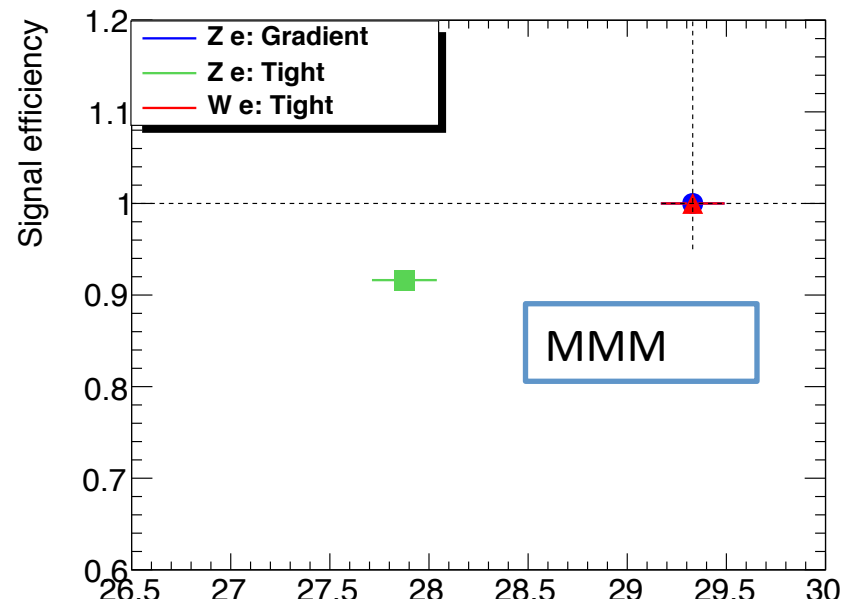
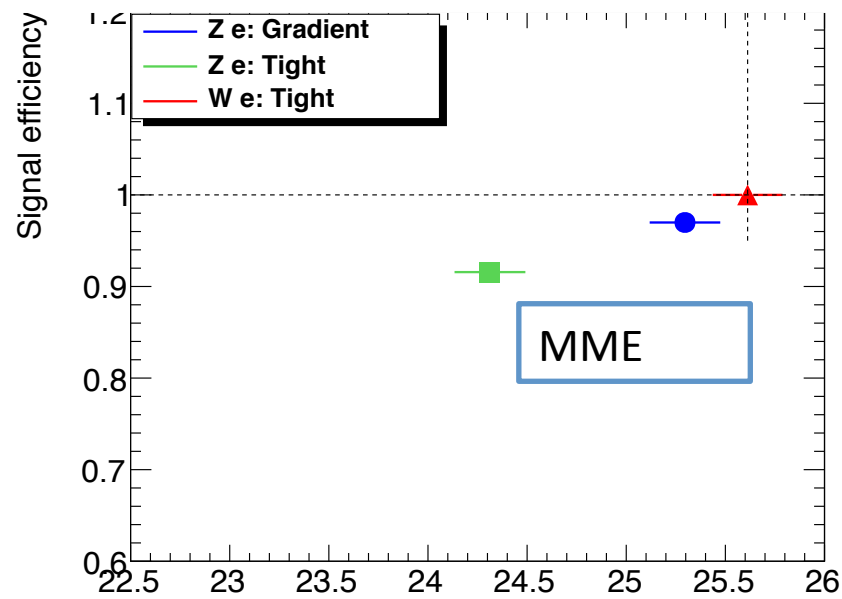
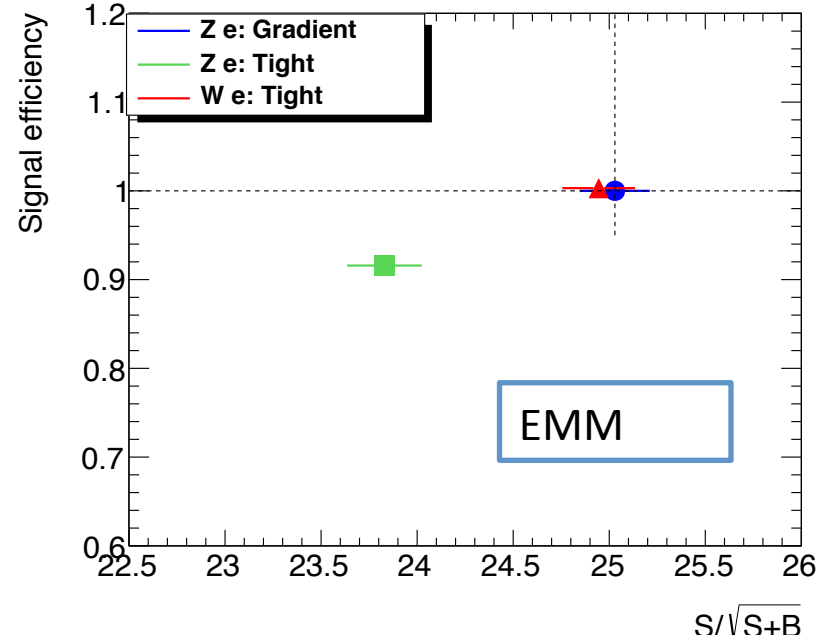
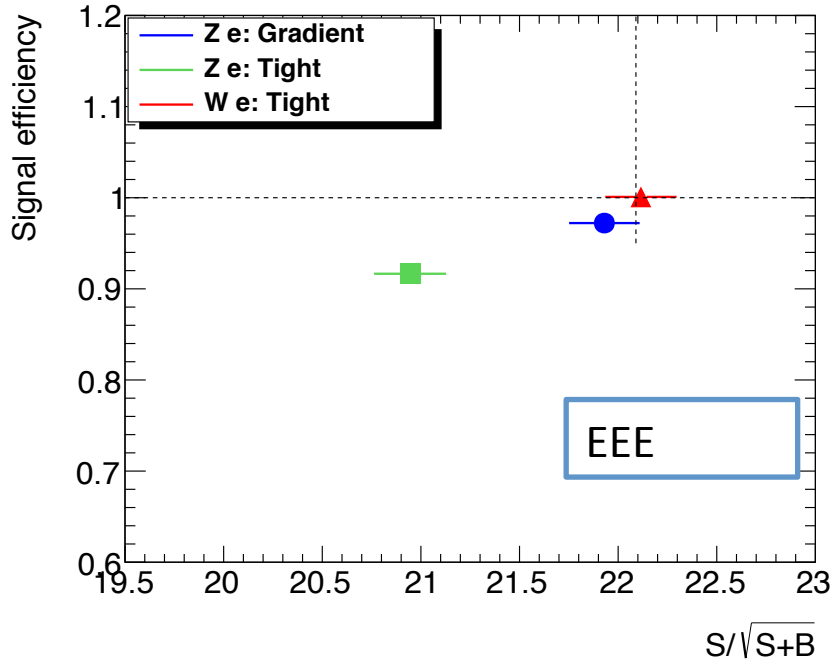
Signal eff. Vs S/B and S/SQRT(S+B)



Signal Efficiency vs. S/B



Signal Efficiency vs. $S/\sqrt{S+B}$



Backup

Working point	Objects	Calo isolation	Track isolation	Combined isolation
Tight	all leptons	96%	99%	95%
LooseTrackOnly	all leptons	-	99%	99%
Loose	all leptons	99%	99%	99%
Gradient	all leptons	$\epsilon=(0.1143 \cdot pT [\text{GeV}]+92.14) \%$	$\epsilon=(0.1143 \cdot pT [\text{GeV}]+92.14) \%$	$\epsilon(25 \text{ GeV}) = 90\%$, $\epsilon(60 \text{ GeV}) = 99\%$
GradientLoose	all leptons	$\epsilon=(0.057 \cdot pT [\text{GeV}]+95.57) \%$	$\epsilon=(0.057 \cdot pT [\text{GeV}]+95.57) \%$	$\epsilon(25 \text{ GeV}) = 95\%$, $\epsilon(60 \text{ GeV}) = 99\%$
FixedCutTight (previously EL0p06)	electrons	Cut: topoetcone20/pT < 0.06	Cut: ptvarcone20/pT < 0.06	-
FixedCutTightTrackOnly (previously MU0p06)	muons	-	Cut: ptvarcone30/pT < 0.06	-
FixedCutTightTrackOnly	electrons	-	Cut: ptvarcone20/pT < 0.06	-
FixedCutLoose	electrons	Cut: topoetcone20/pT < 0.2	Cut: ptvarcone20/pT < 0.15	-
FixedCutLoose	muons	Cut: topoetcone20/pT < 0.3	Cut: ptvarcone30/pT < 0.15	-