

Jet Smearing With New Matrix Parameters

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Working Group Meeting

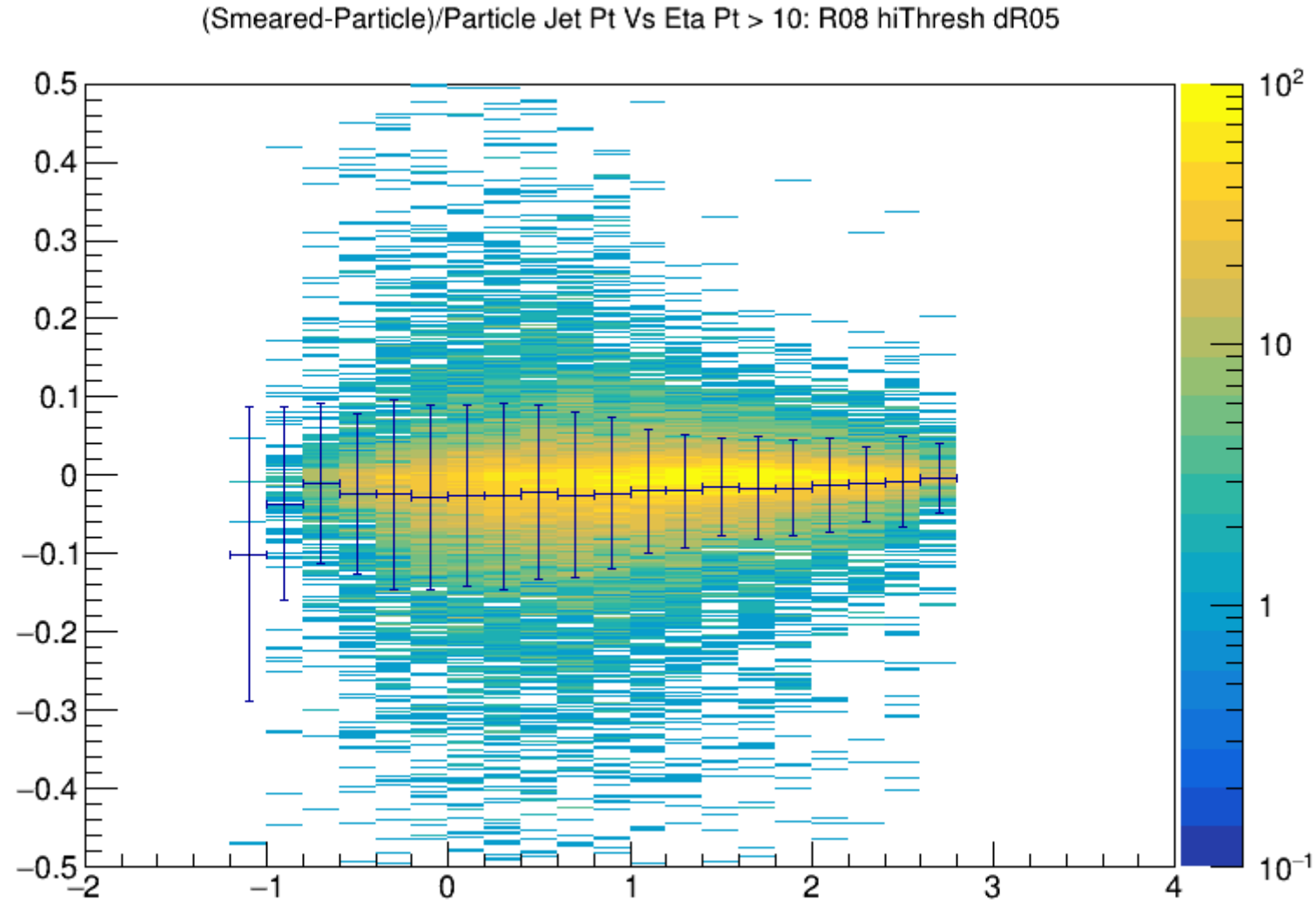
December 10th, 2020

- ❑ New YR detector matrix parameters were released at the Berkeley meeting
- ❑ Two options for tracking with different resolutions and min pT thresholds – 3T and 1.5T configurations
 - How will these affect jet energy scale / resolution and substructure
 - Is resolution or pT threshold more critical
- ❑ New ECal energy resolution parameterization ($A/E + B/\sqrt{E} + C$)
 - How do variations in resolution affect jet energy scale / resolution

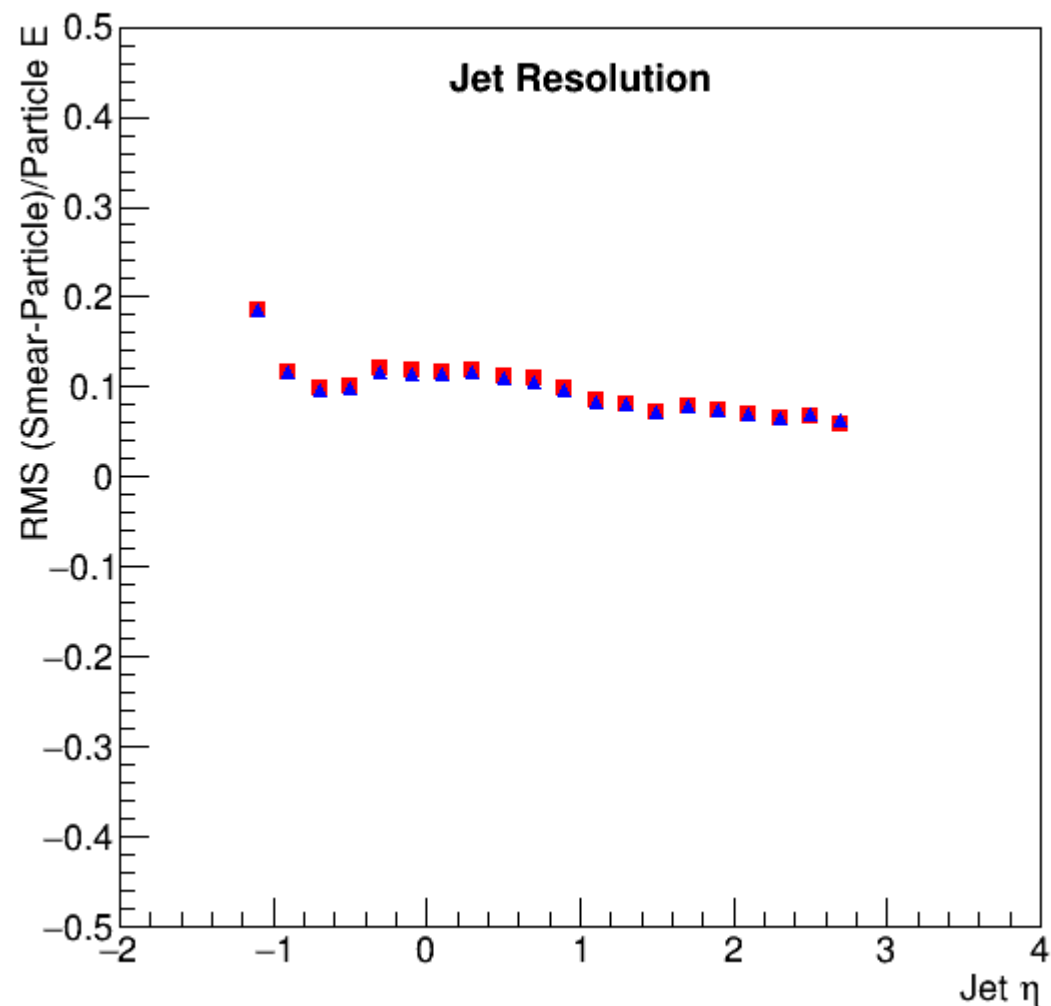
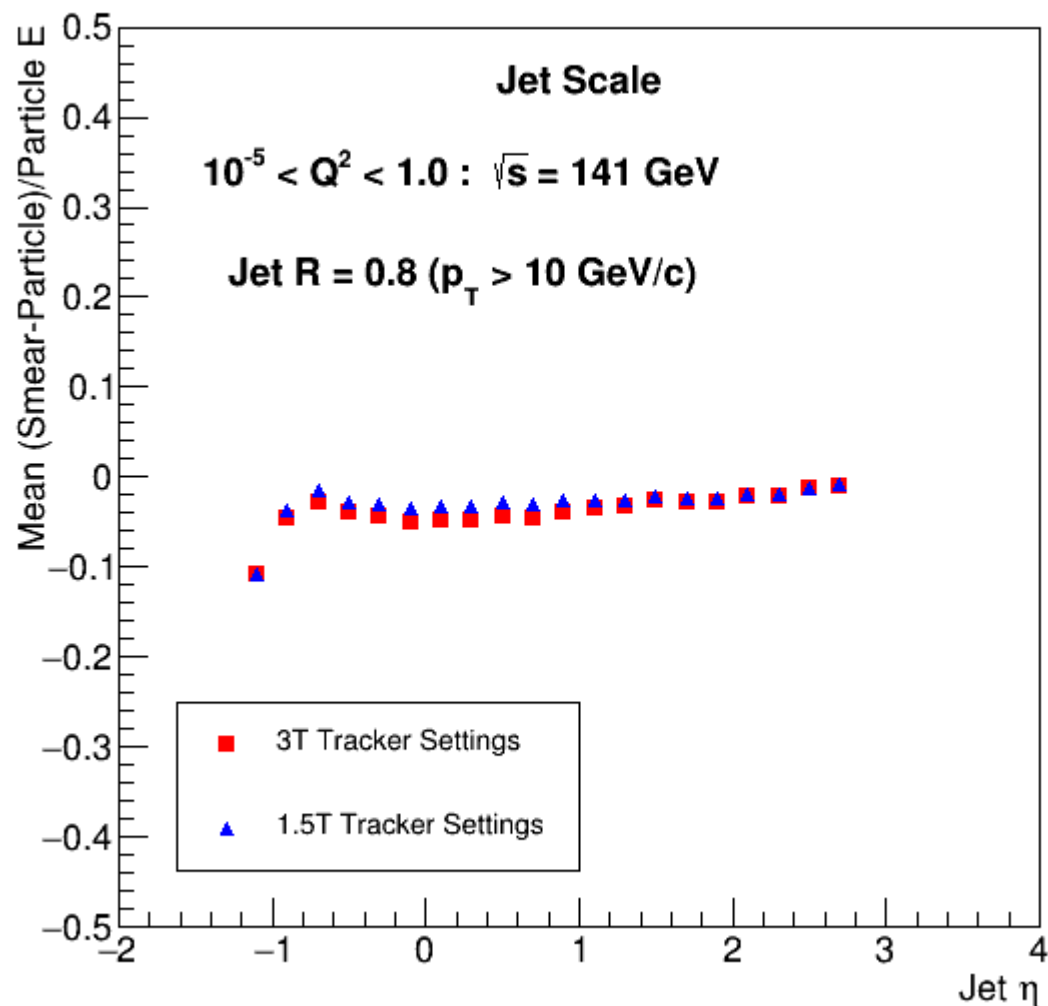
Tracking Parameters: 3T vs 1.5T

Eta Range	3T Mom Res	1.5T Mom Res	3T Min pT	1.5T Min pT
-3.5 to -3.0	$0.1\% \cdot P + 2\%$	$0.2\% \cdot P + 5\%$	150 MeV	100 MeV
-3.0 to -2.5	“	“	150 MeV	100 MeV
-2.5 to -2.0	$0.02\% \cdot P + 1\%$	$0.04\% \cdot P + 2\%$	220 MeV	130 MeV
-2.0 to -1.5	“	“	160 MeV	70 MeV
-1.5 to -1.0	“	“	300 MeV	150 MeV
-1.0 to -0.5	$0.02\% \cdot P + 0.5\%$	$0.04\% \cdot P + 1\%$	400 MeV	200 MeV
-0.5 to 0.0	“	“	400 MeV	200 MeV

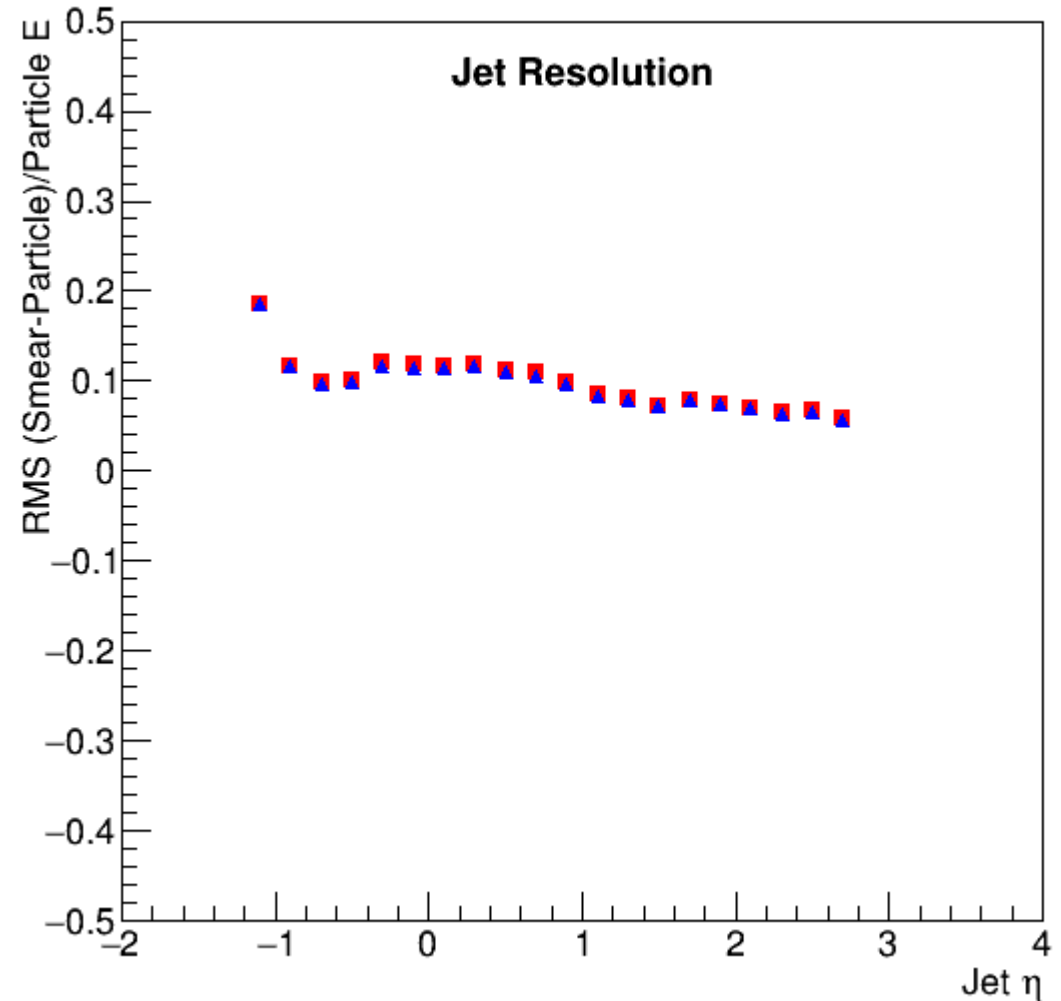
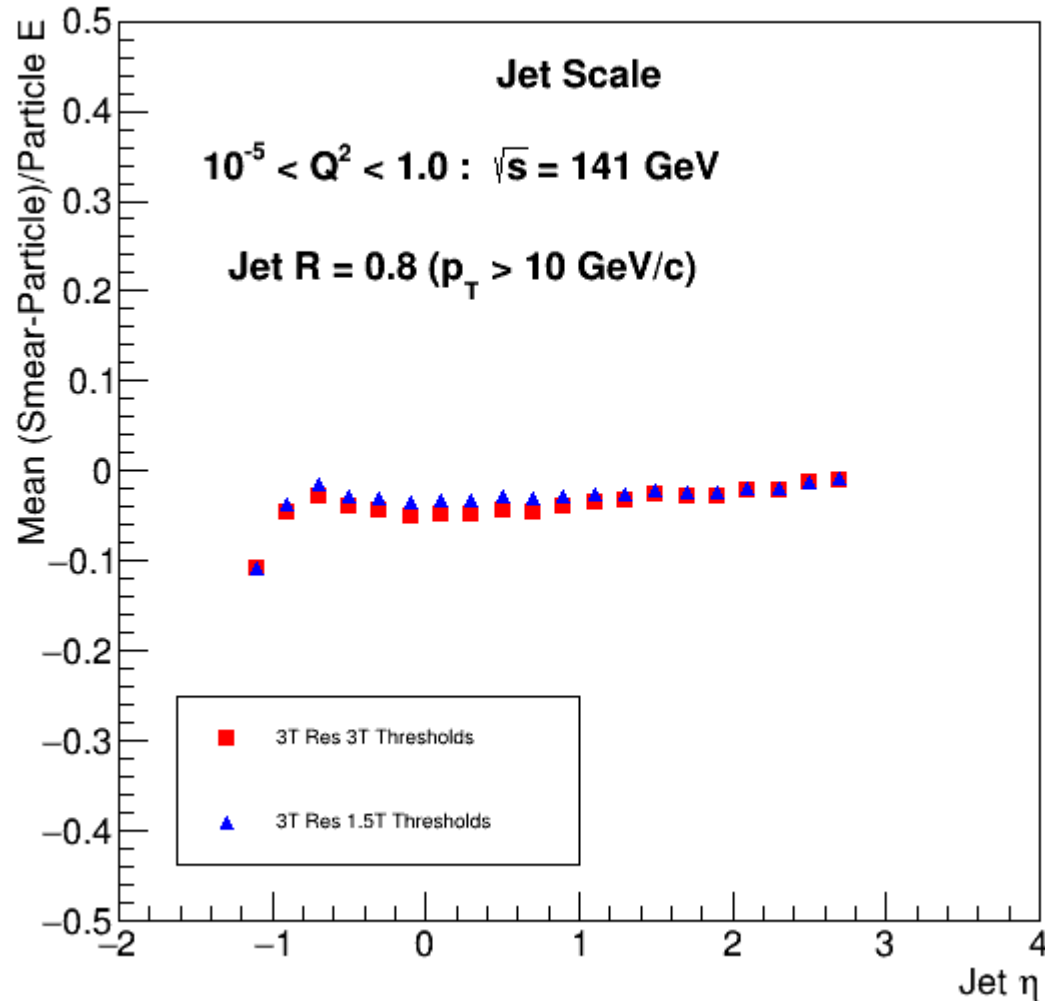
Quantities I'm Plotting



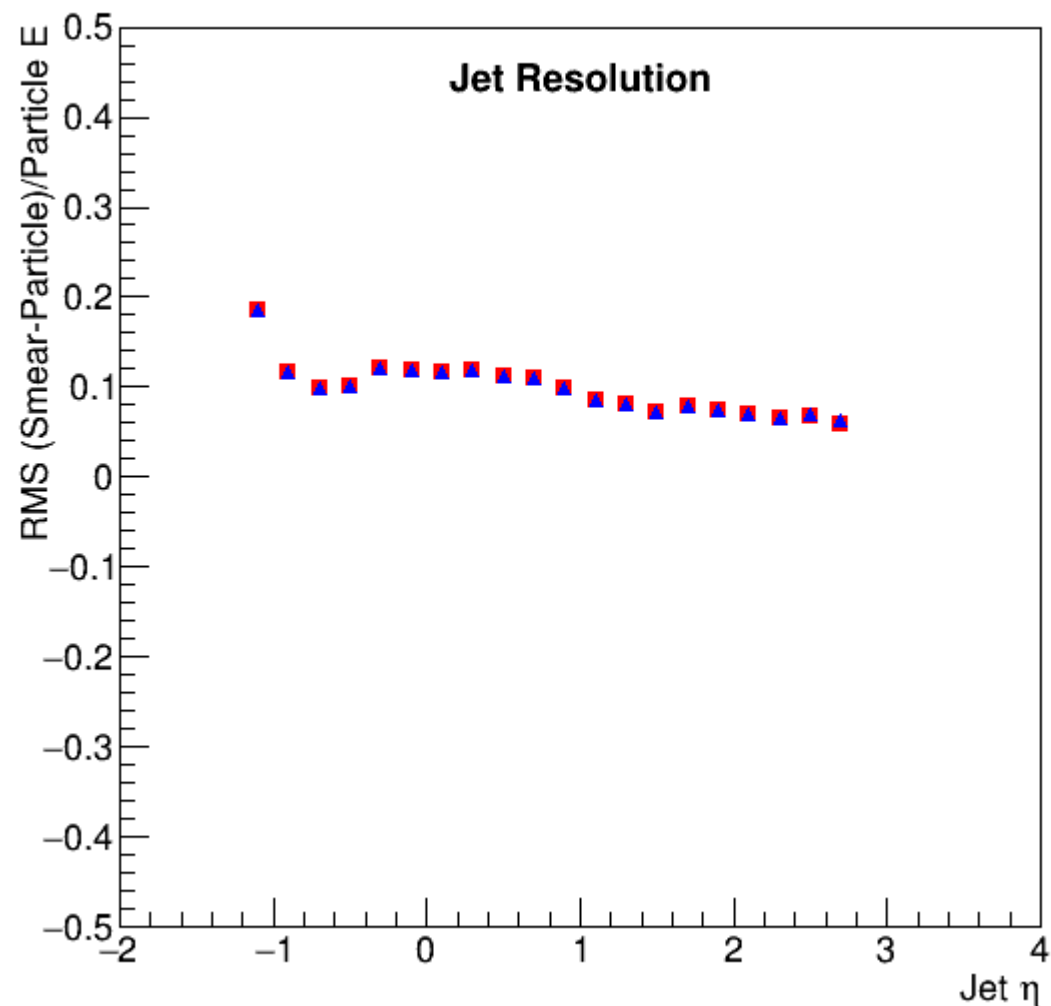
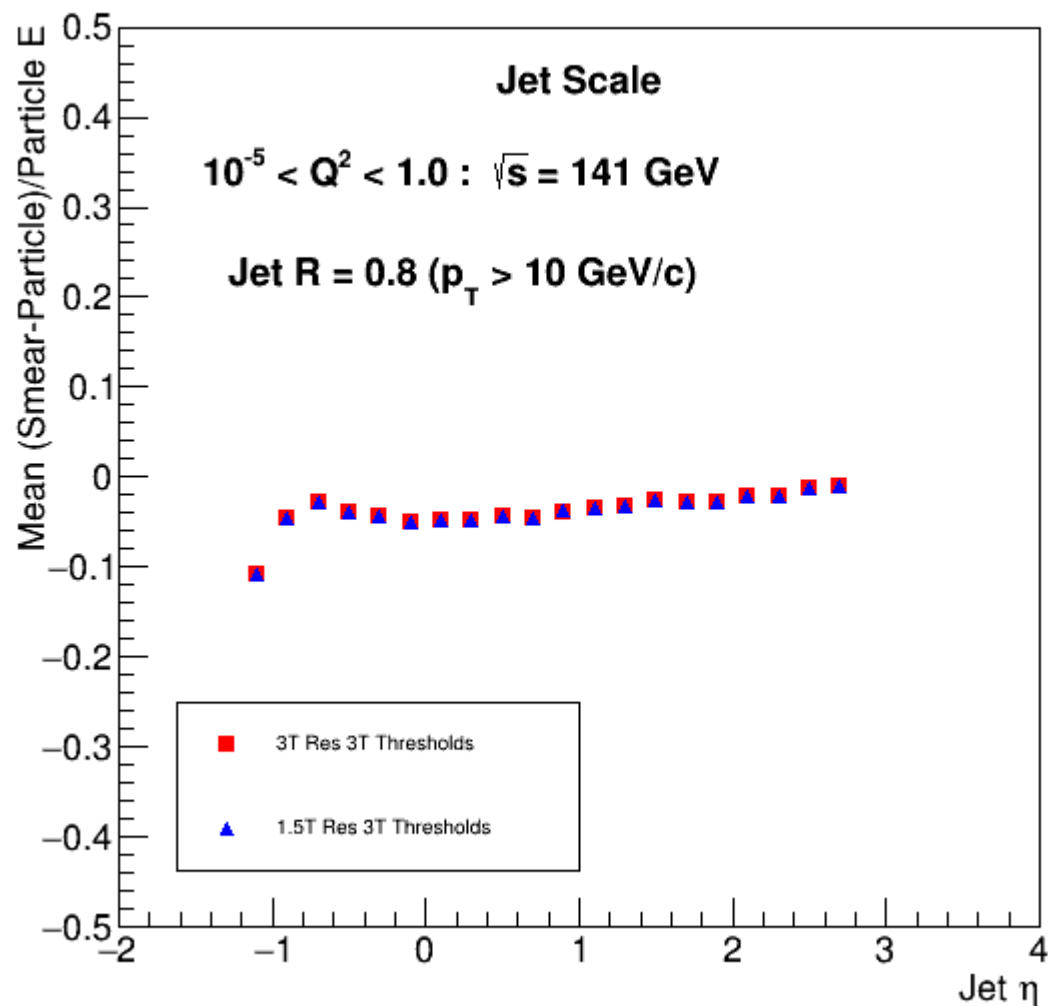
Jet Response: 3T vs 1.5T



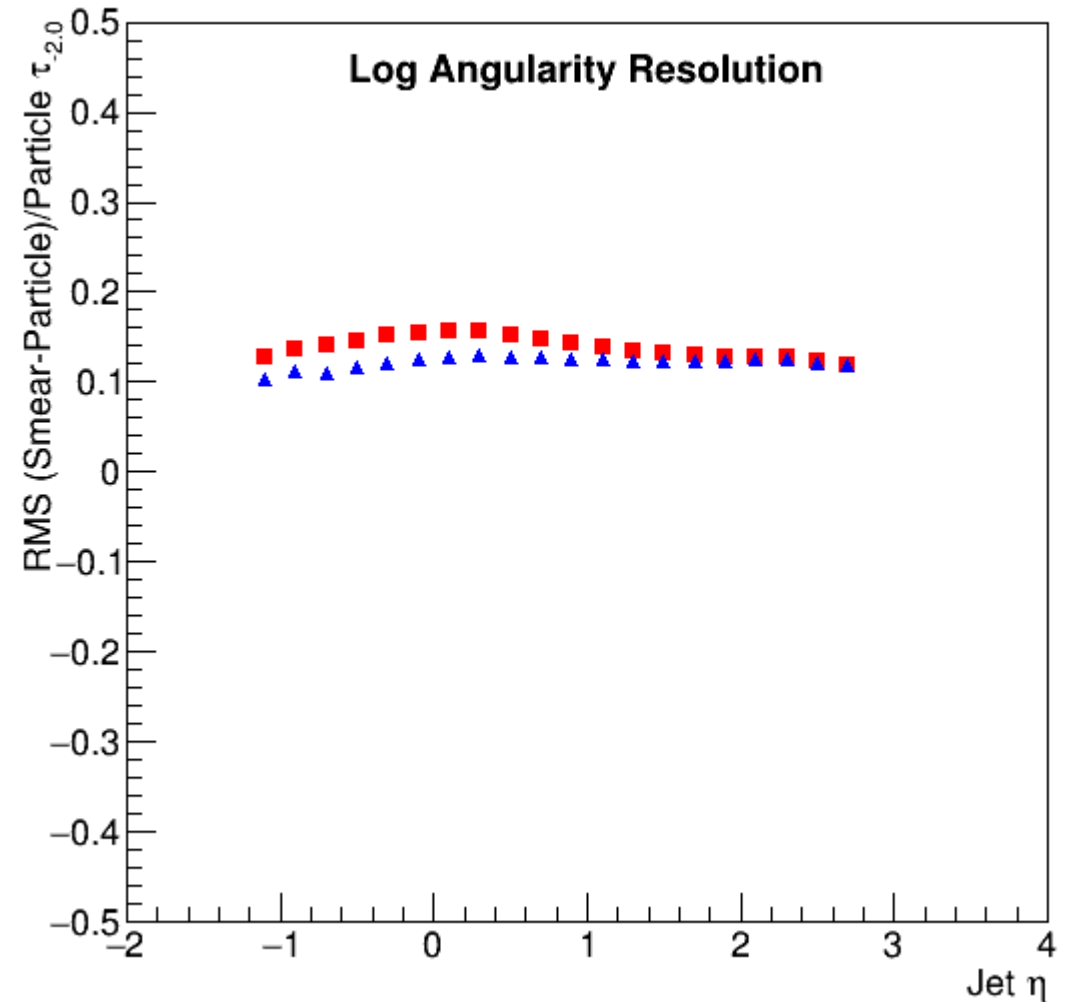
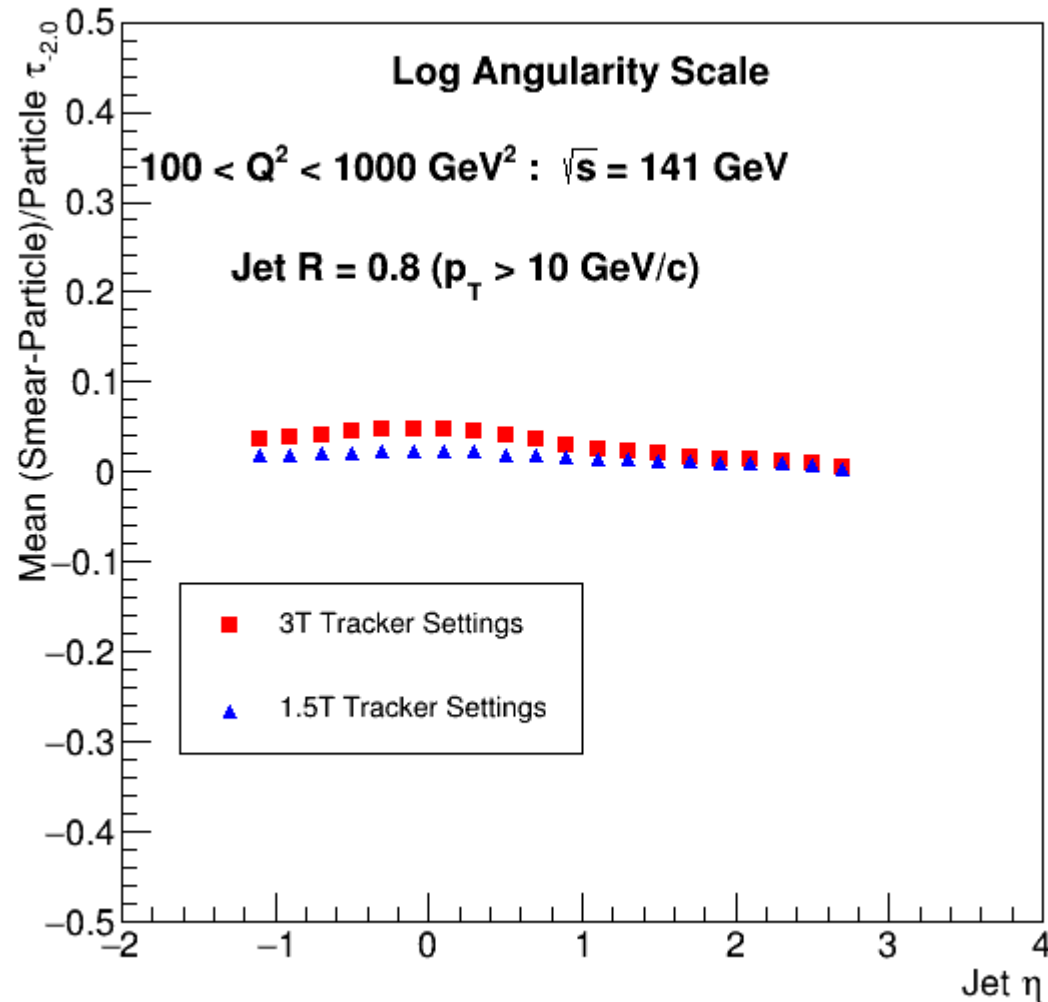
Jet Response: 3T vs 1.5T Thresholds



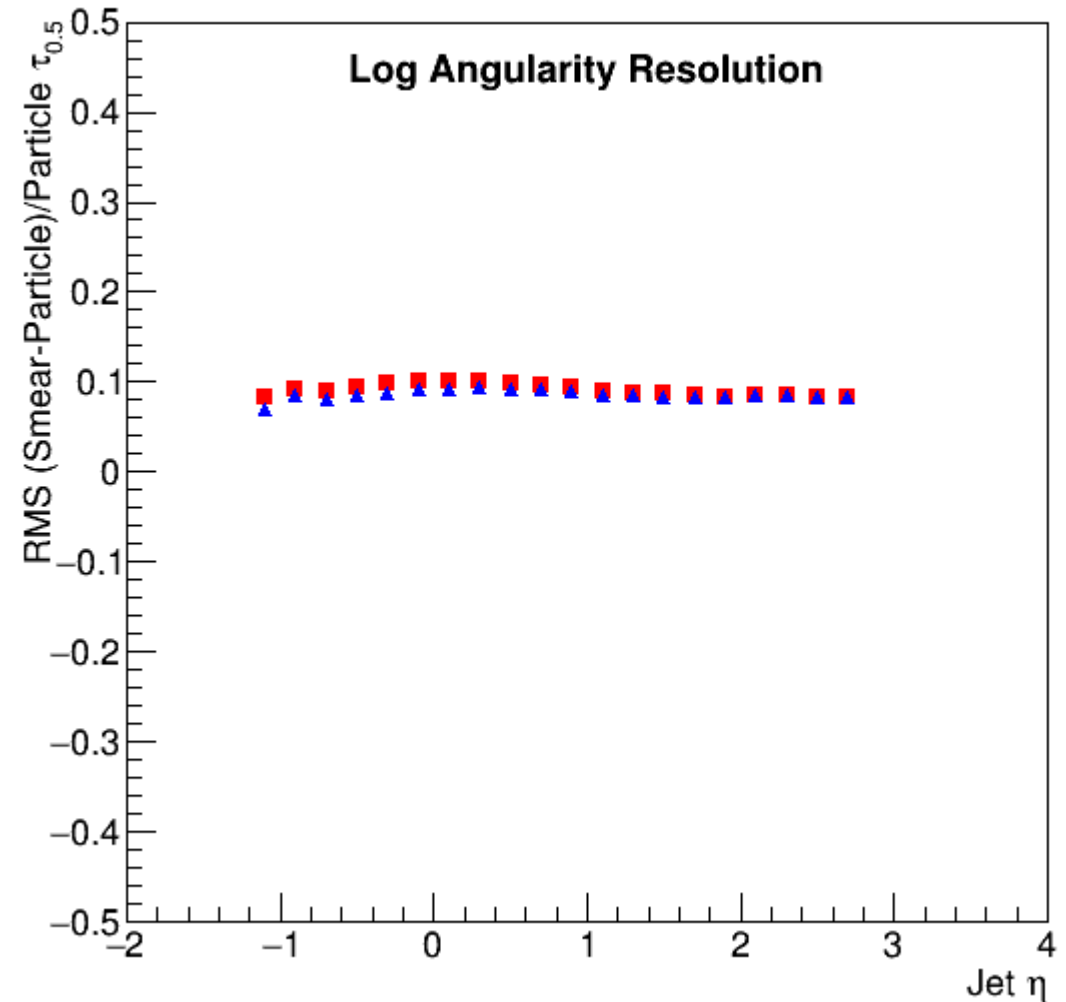
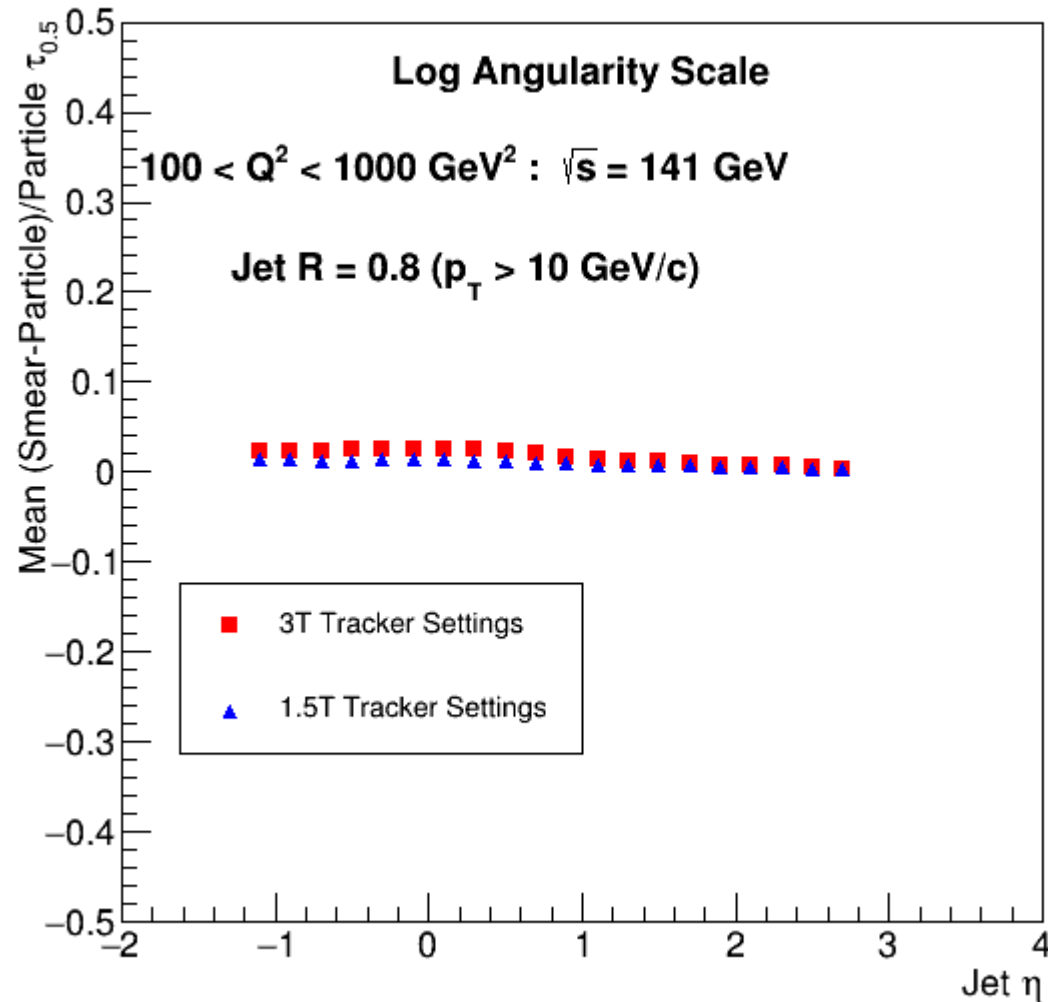
Jet Response: 3T vs 1.5T Fields



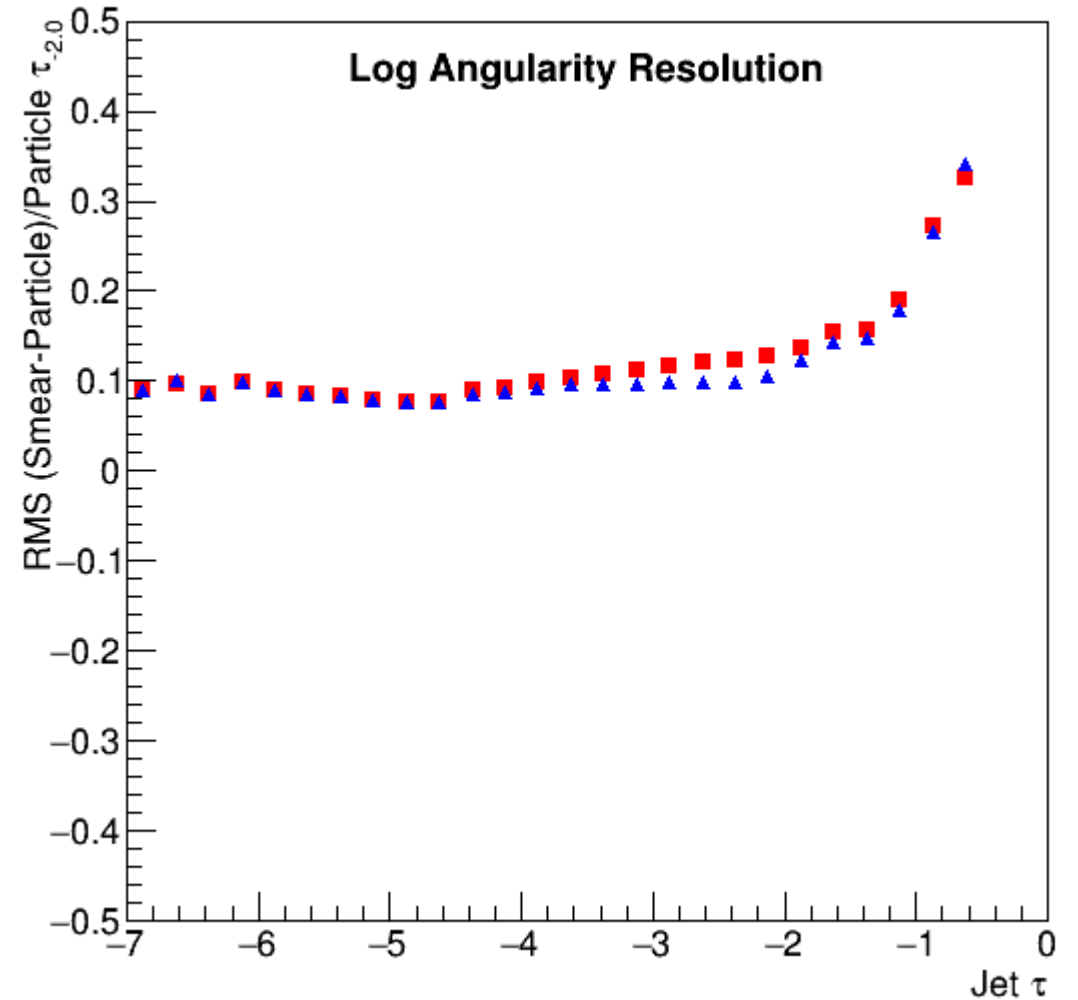
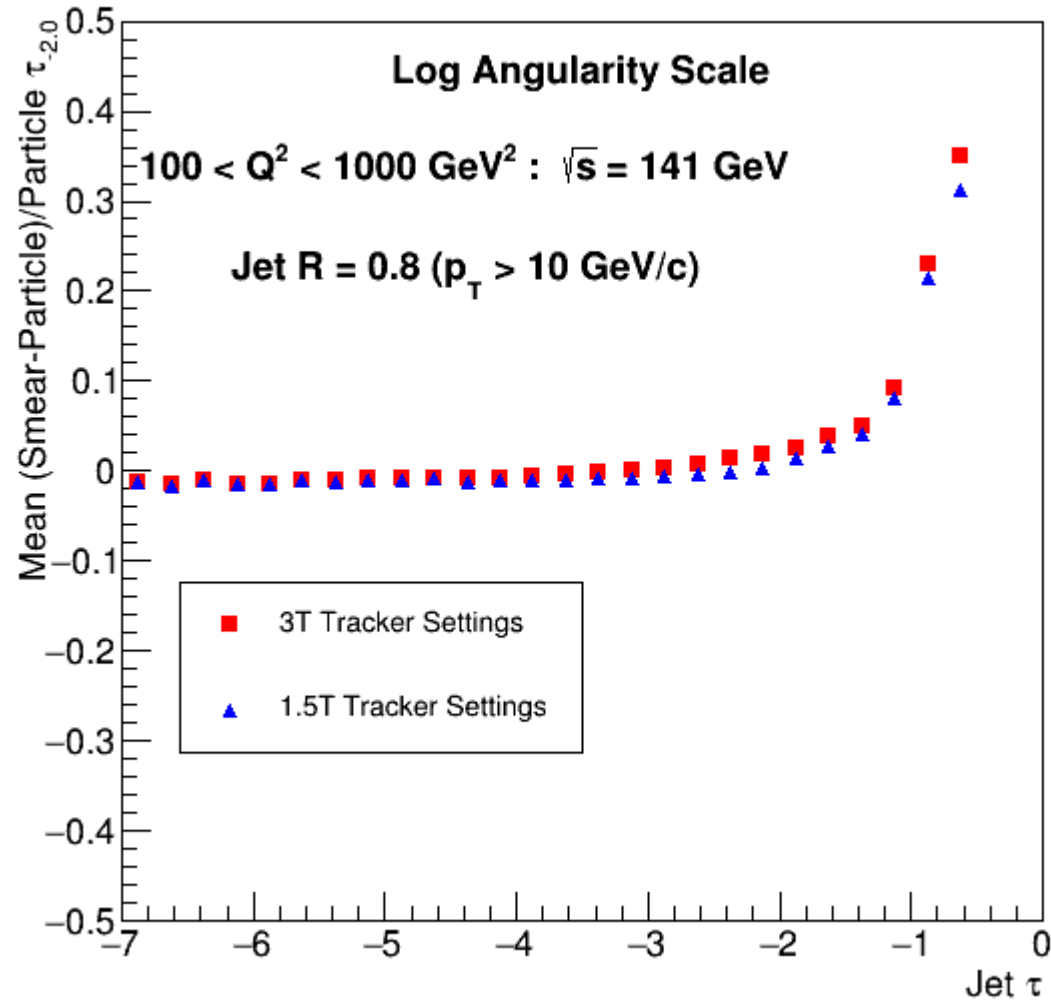
Jet Angularity ($a = -2$): 3T vs 1.5T Fields



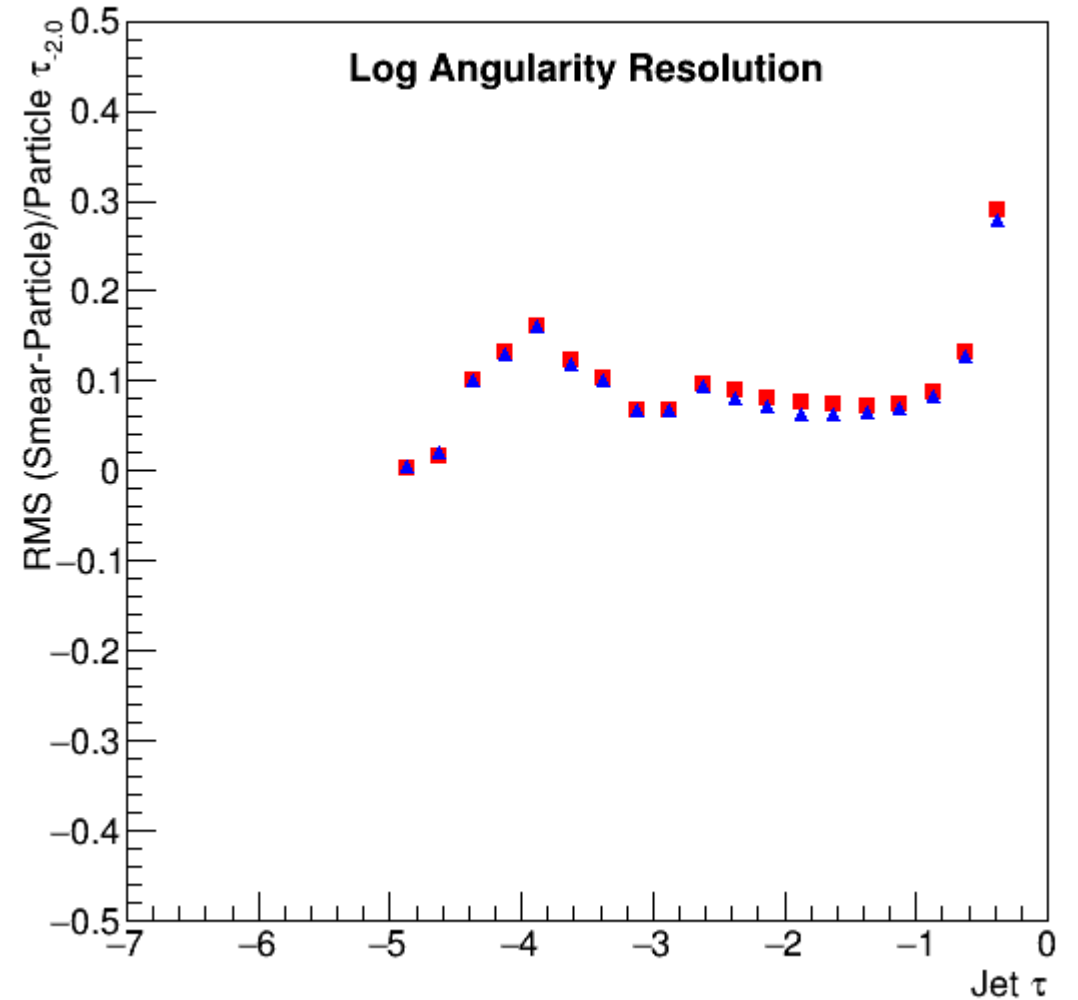
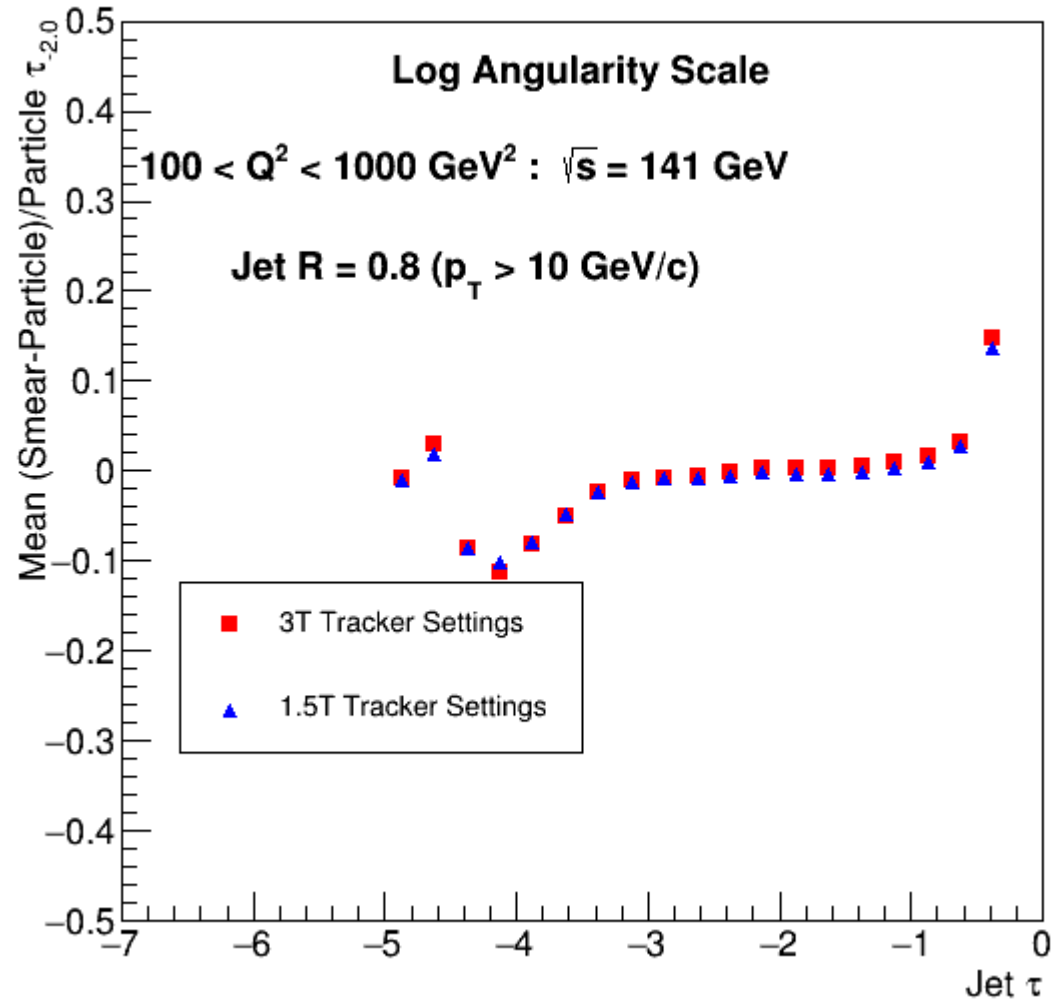
Jet Angularity ($a = 0.5$): 3T vs 1.5T Fields



Jet Angularity ($a = -2$): 3T vs 1.5T Fields



Jet Angularity ($a = 0.5$): 3T vs 1.5T Fields

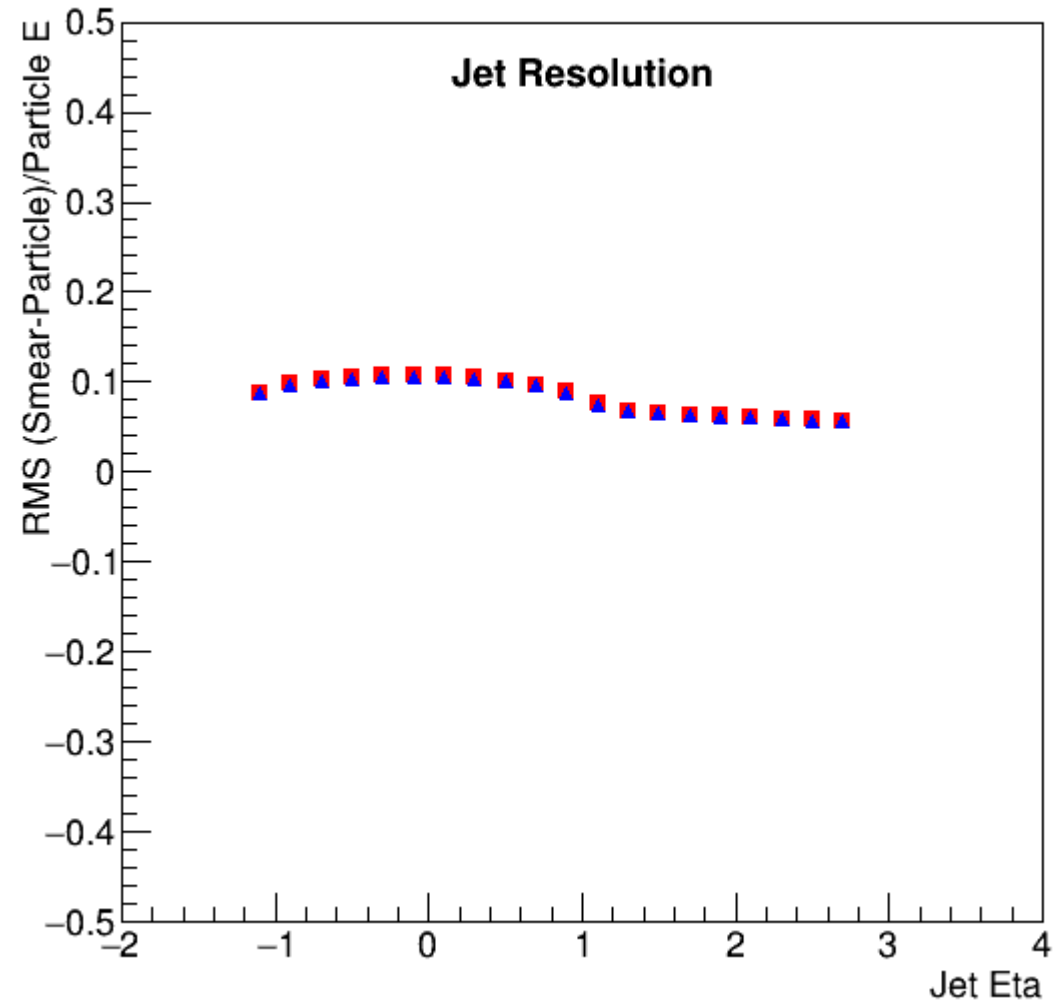
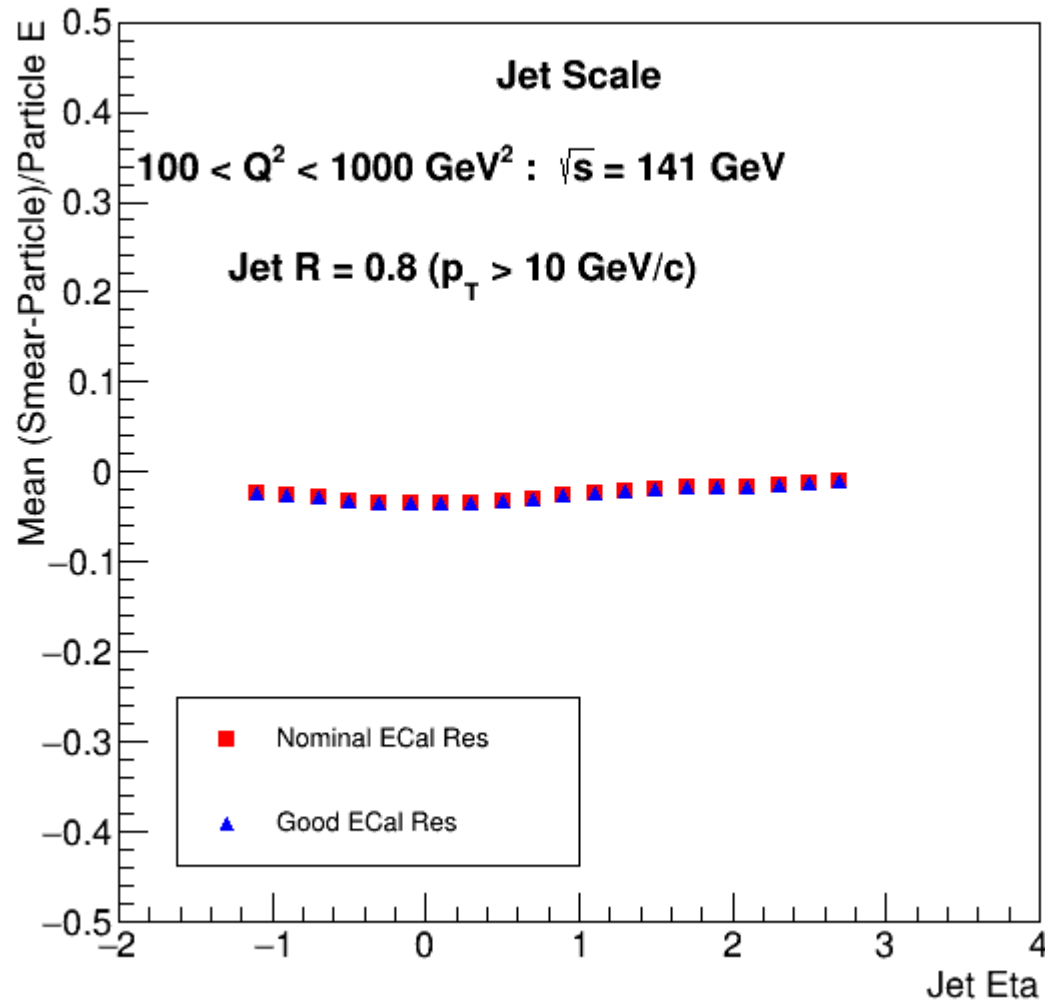


ECal Parameters: Standard and Ideal

$$\sigma E/E = A/E + B/\sqrt{E} + C$$

Eta Range	Standard Resolution	Ideal Resolution
-3.5 to -2.0	A=1%, B=2.5%, C=1%	A=1%, B=2.5%, C=1%
-2.0 to -1.0	A=2%, B=8%, C=2%	A=2%, B=4%, C=2%
-1.0 to 1.0	A=2%, B=14%, C=3%	A=2%, B=4%, C=1.5%
1.0 to 3.5	A=2%, B=12%, C=2%	A=2%, B=4%, C=1.5%

Jet Response: Standard Vs Ideal



Jet Response: Standard Vs Ideal

