



DHCAL Energy resolution studies

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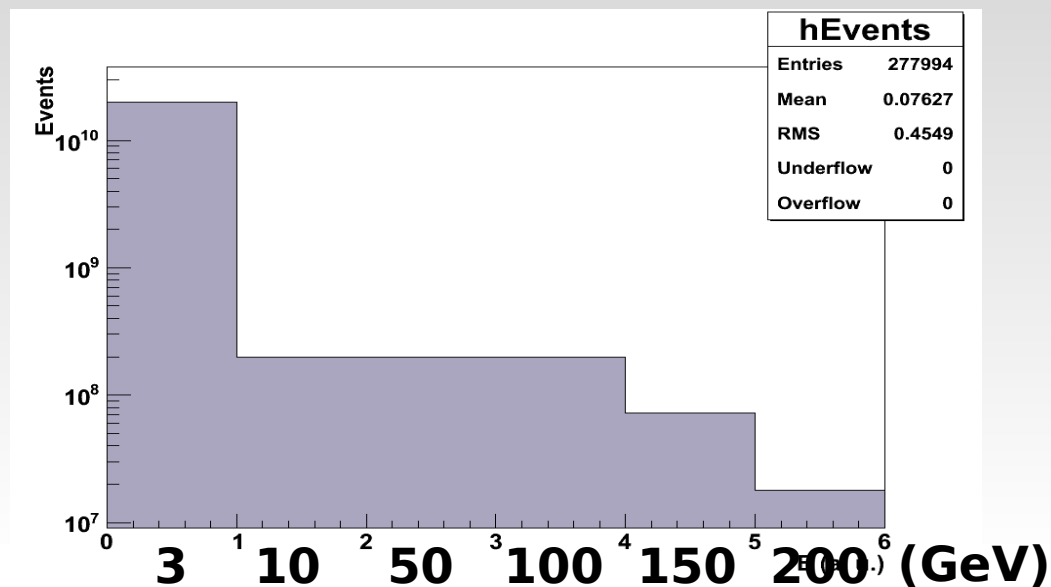
**MicroMegas Physics Meeting
LAPP, 31 Mars 2009**



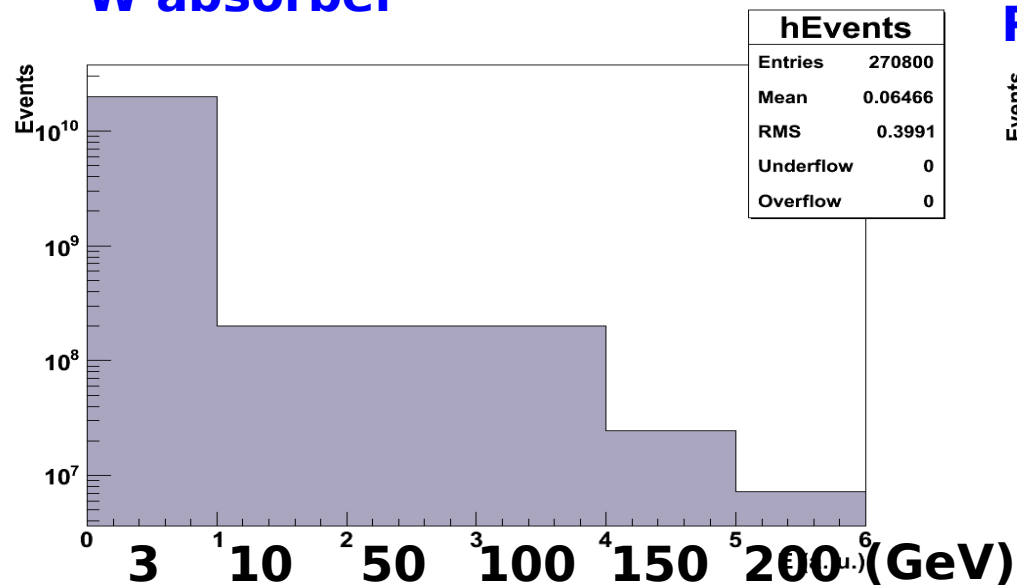
Mass data production

	3	10	50	100	150	200
Fe	200k	20k	20k	20k	12k	6k
W	200k	20k	20k	20k	7k	3.8k
Pb	200k	20k	20k	20k	7k	1.25k

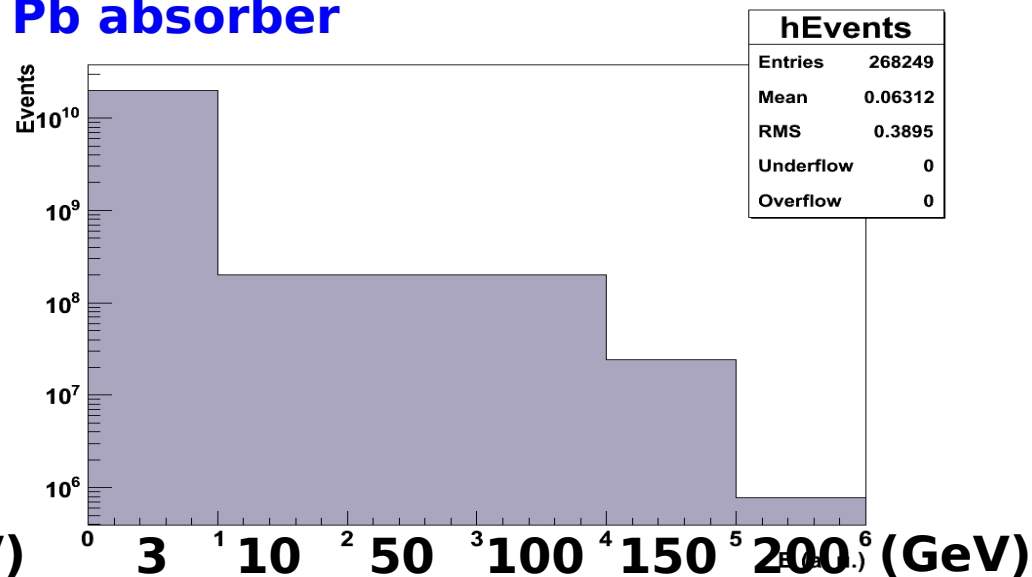
Fe absorber



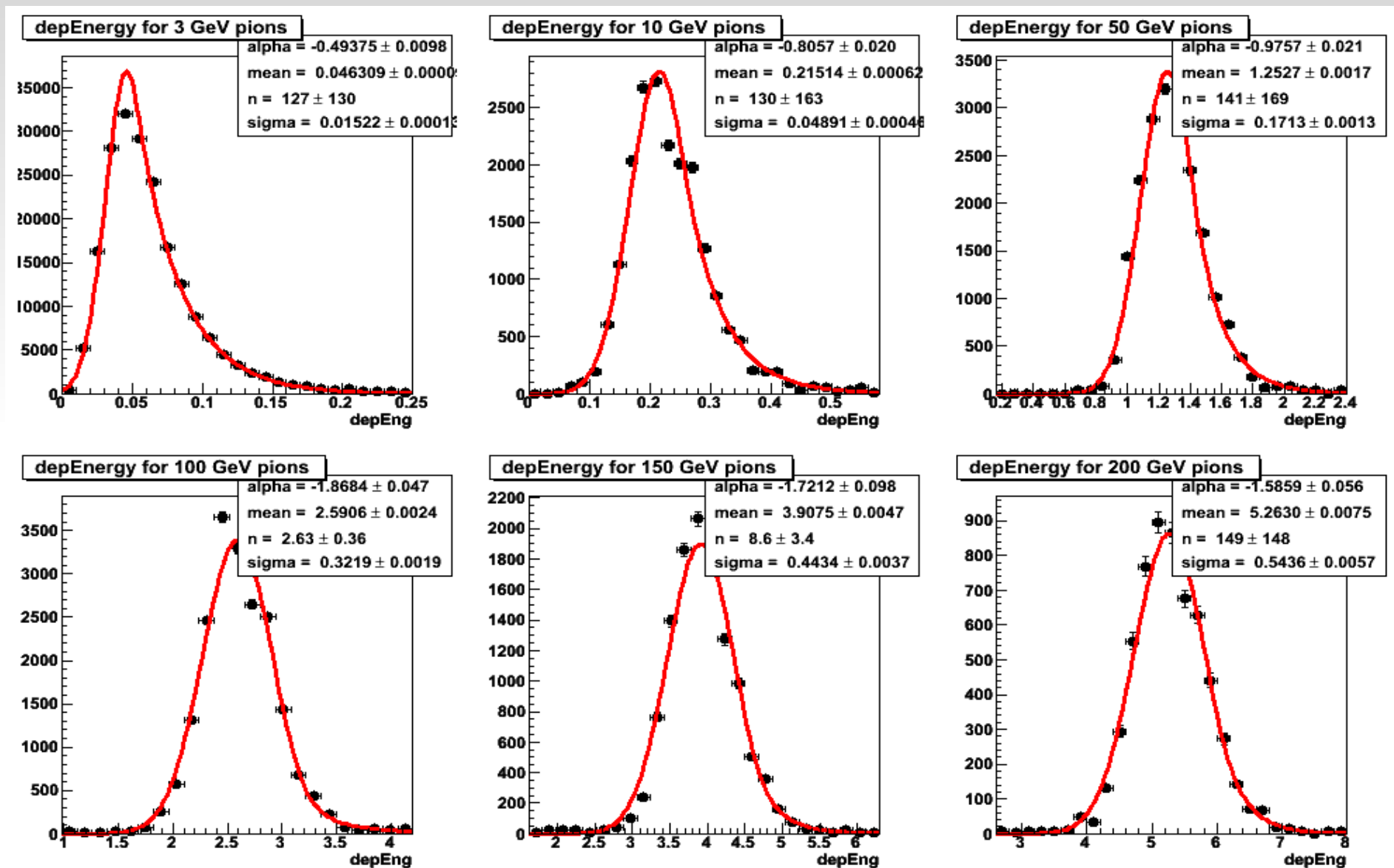
W absorber



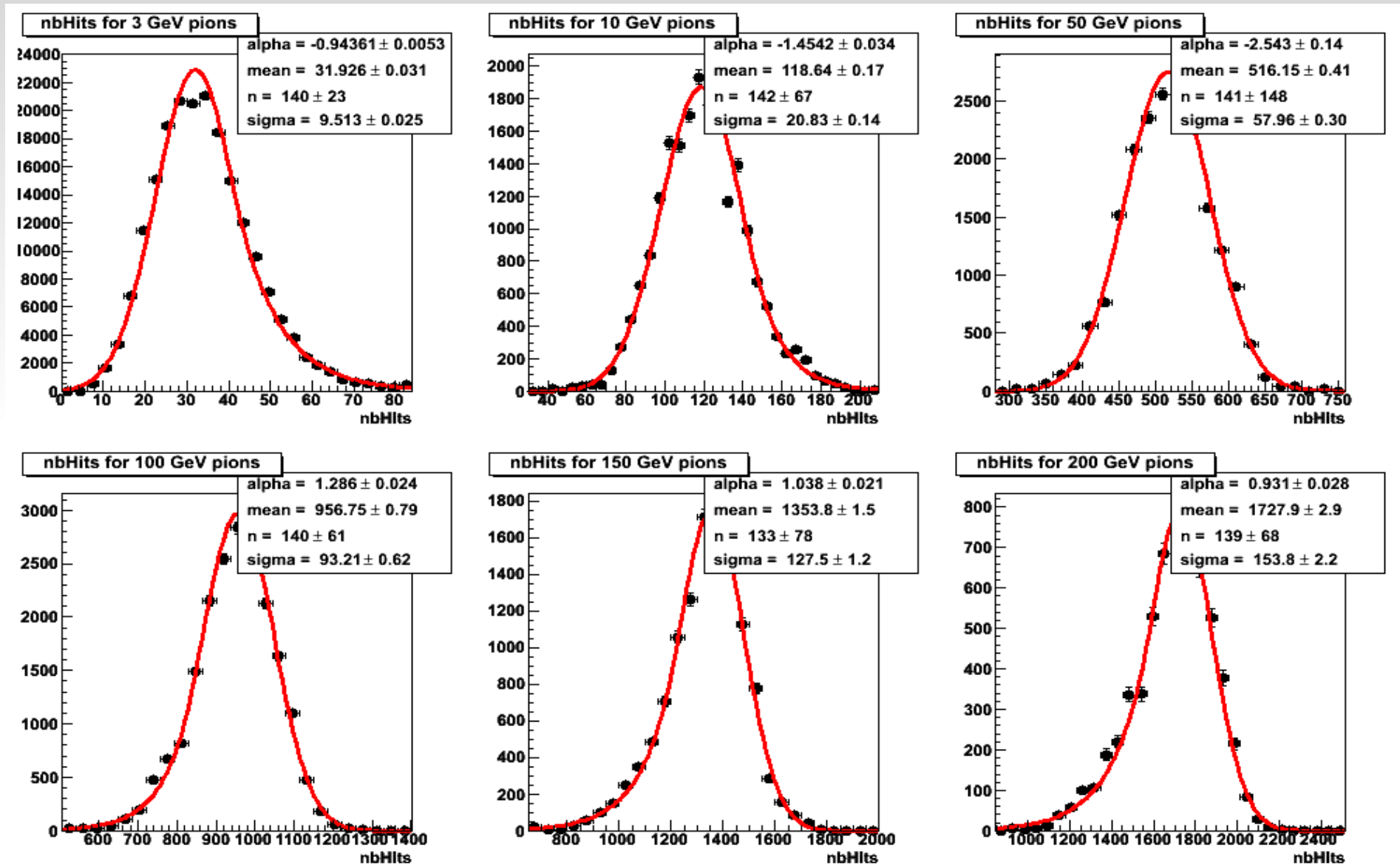
Pb absorber



Fe abs: Dep. energy distributions

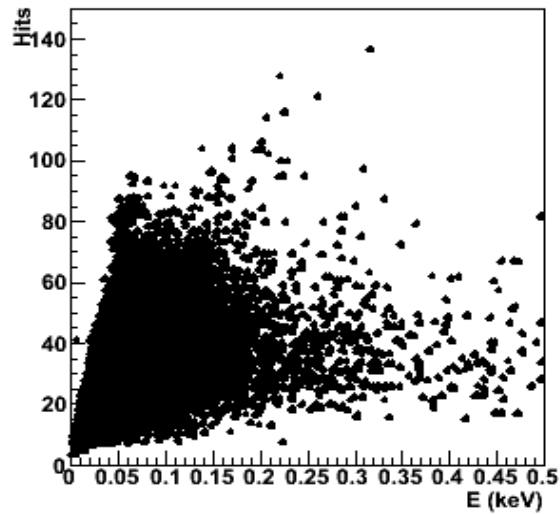


Fe abs: Hit distributions

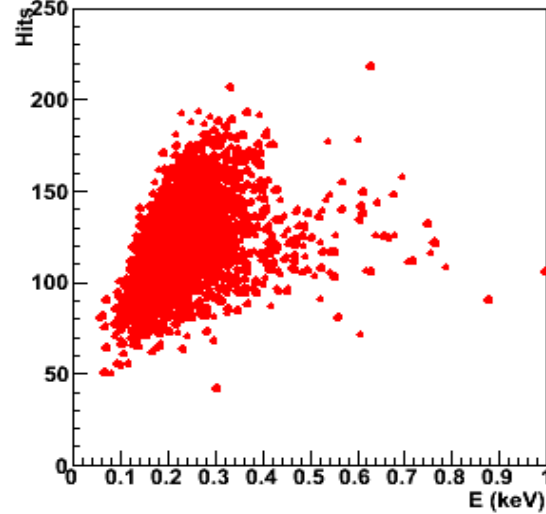


Fe abs: correlations

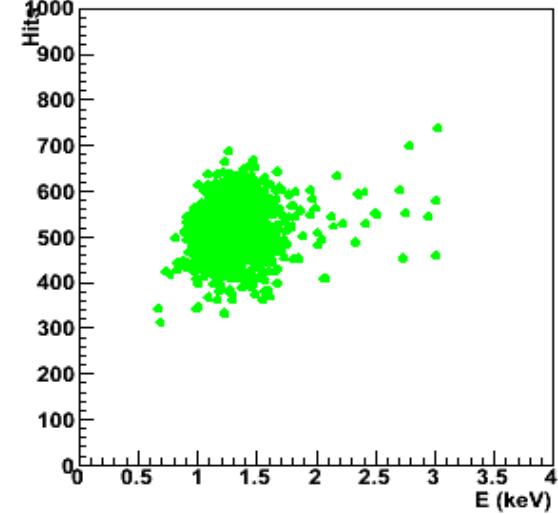
hDepEngVsHits3GeV



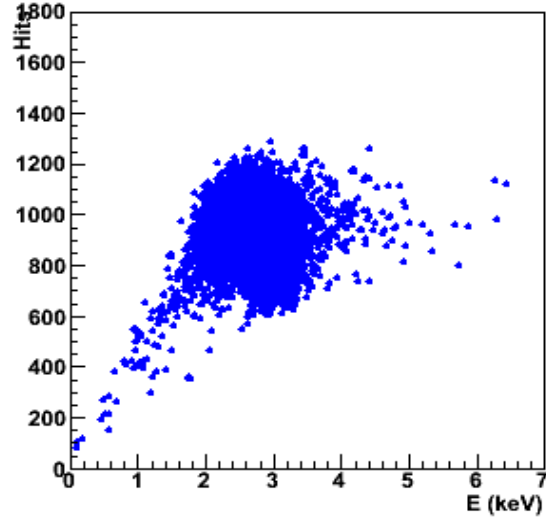
hDepEngVsHits10GeV



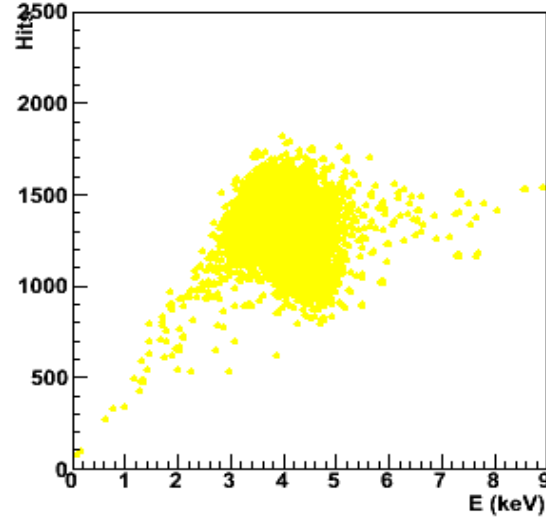
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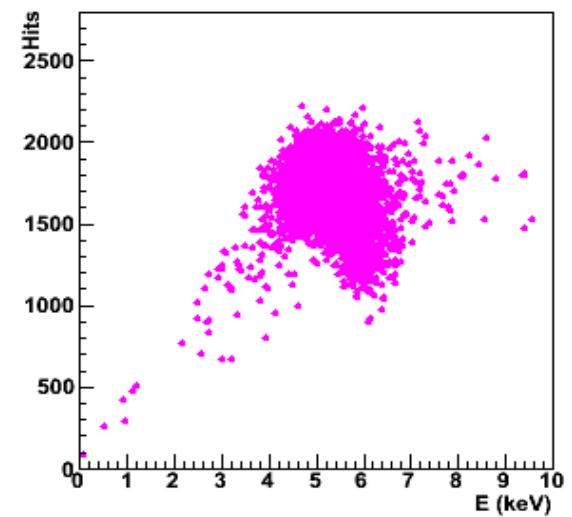
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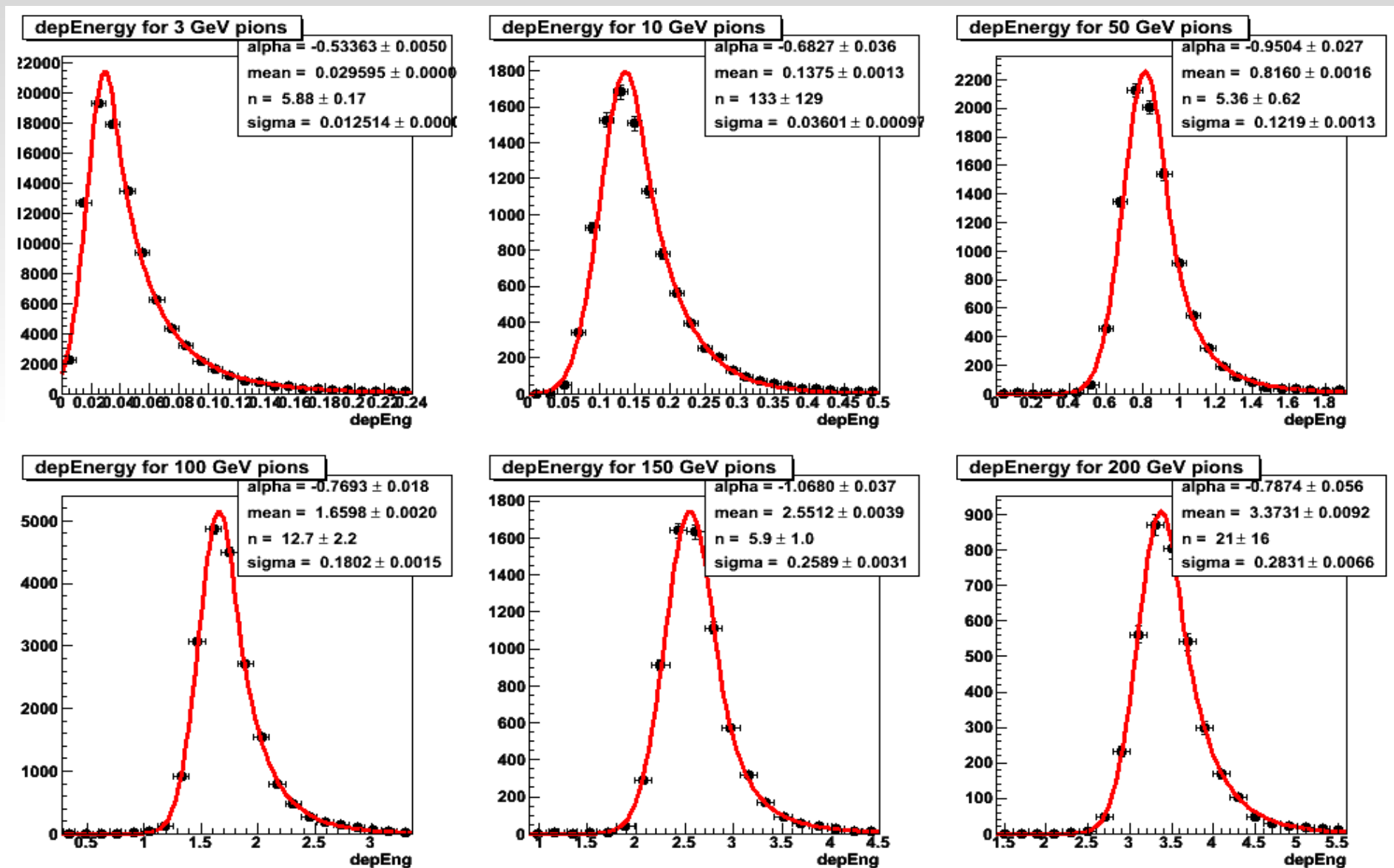
hDepEngVsHits150GeV



hDepEngVsHits200GeV

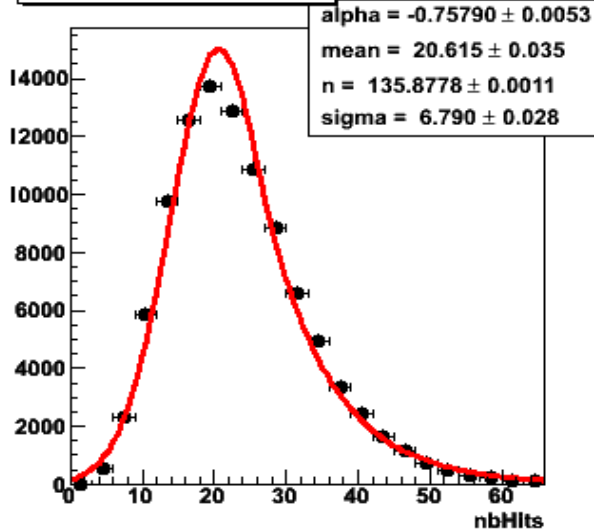


W abs: Dep. energy distributions

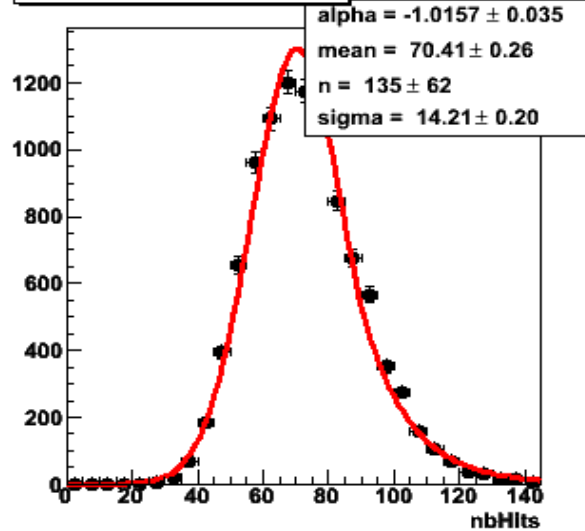


W abs: Hit distributions

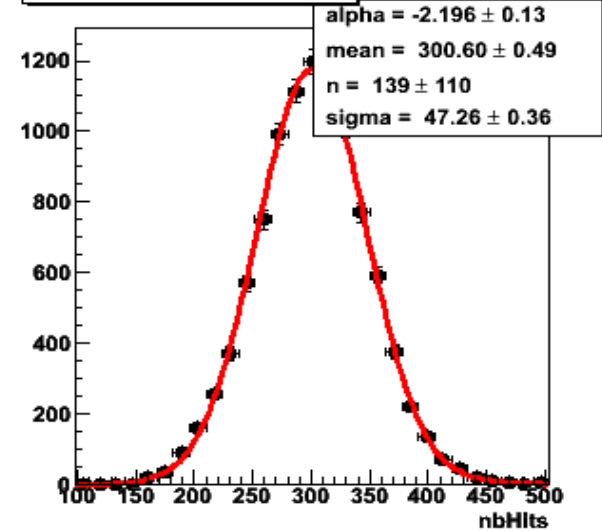
nbHits for 3 GeV pions



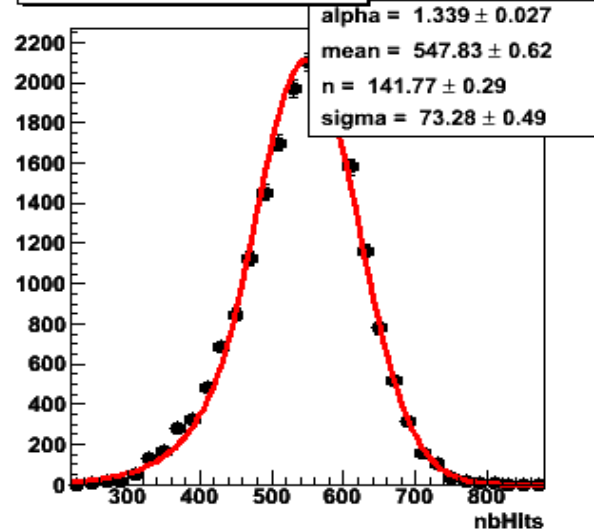
nbHits for 10 GeV pions



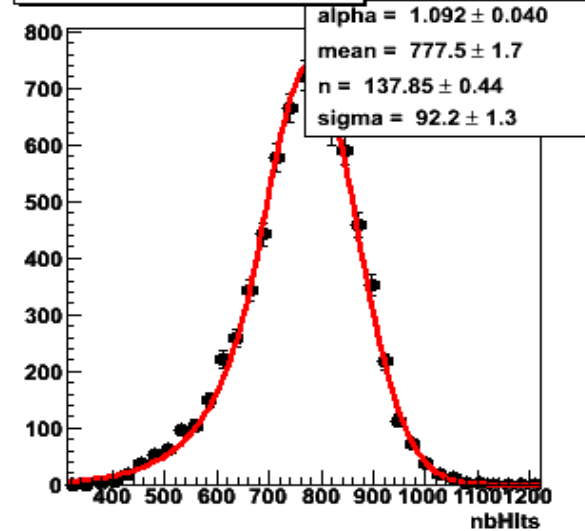
nbHits for 50 GeV pions



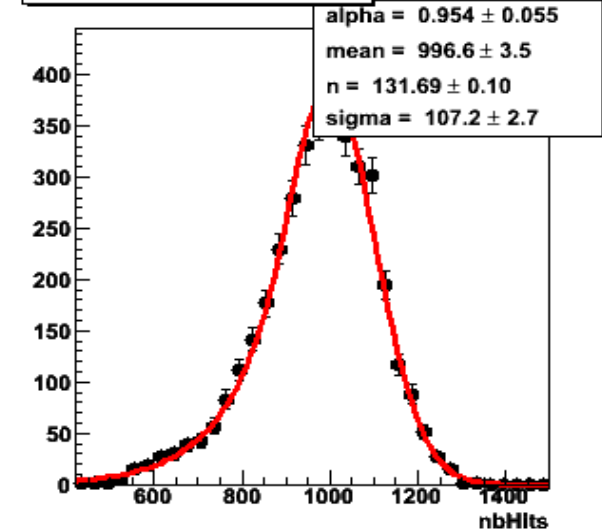
nbHits for 100 GeV pions



nbHits for 150 GeV pions

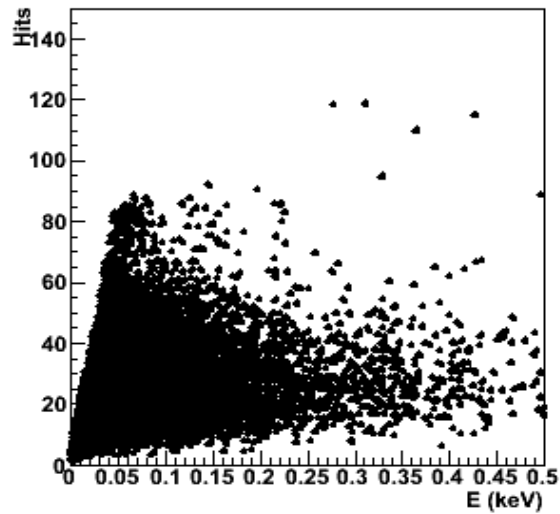


nbHits for 200 GeV pions

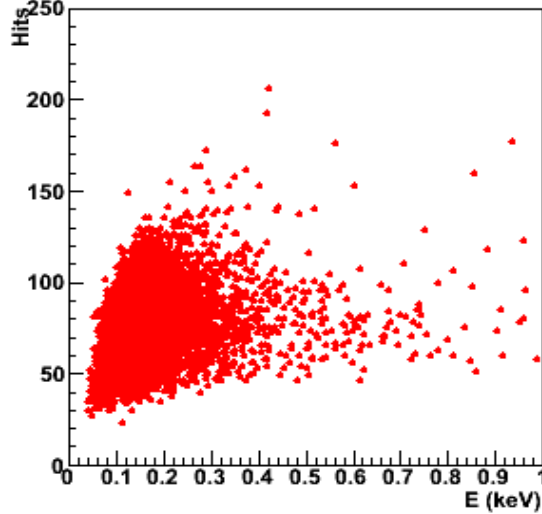


W abs: correlations

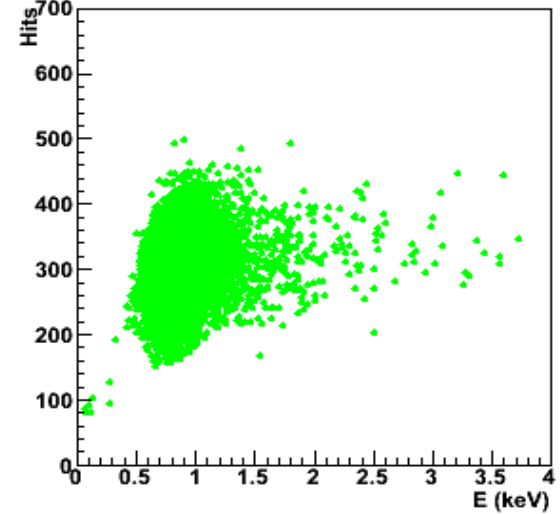
hDepEngVsHits3GeV



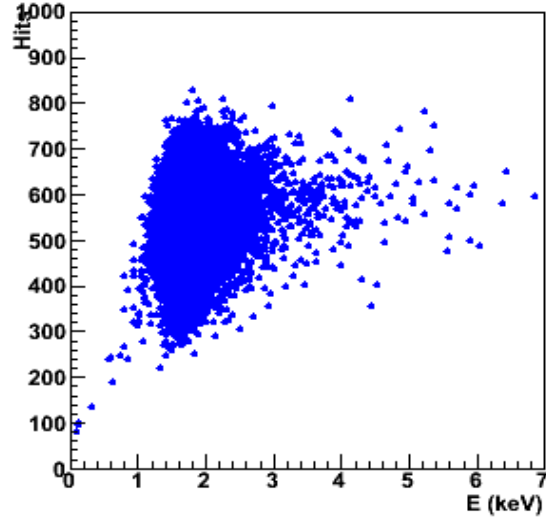
hDepEngVsHits10GeV



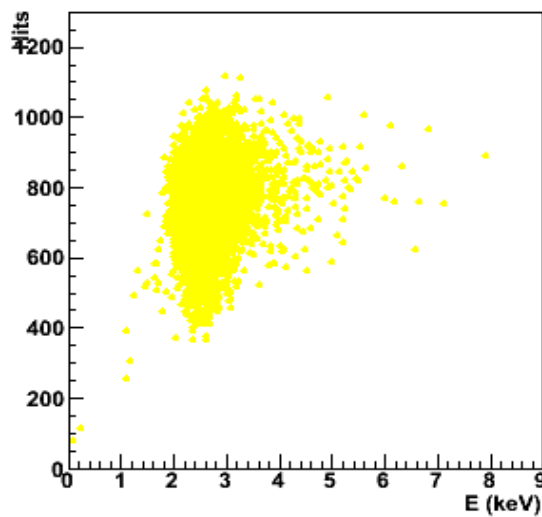
hDepEngVsHits50GeV



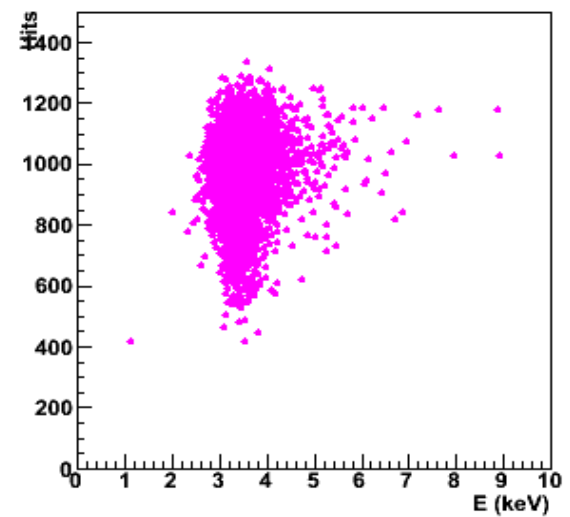
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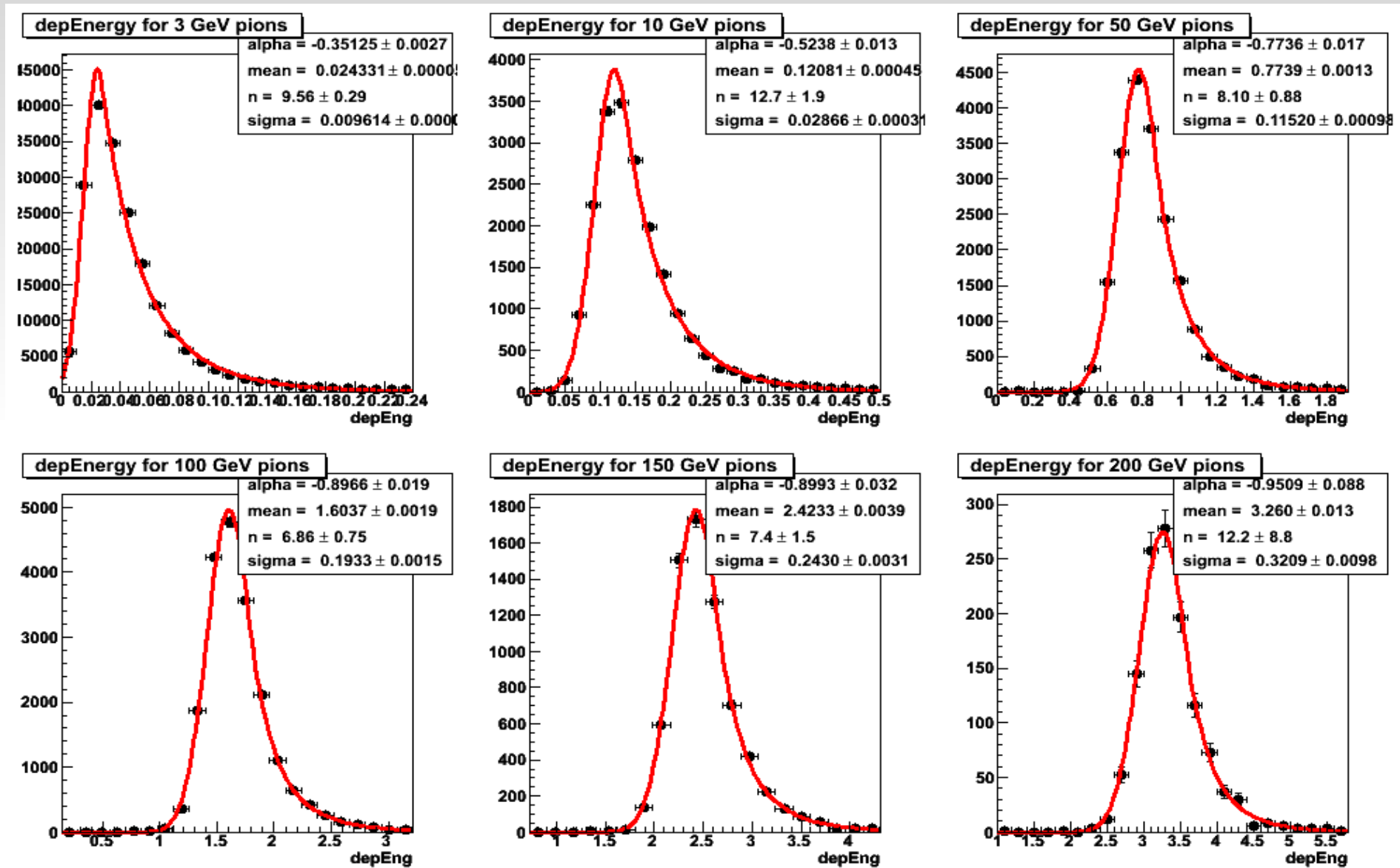
hDepEngVsHits150GeV



hDepEngVsHits200GeV

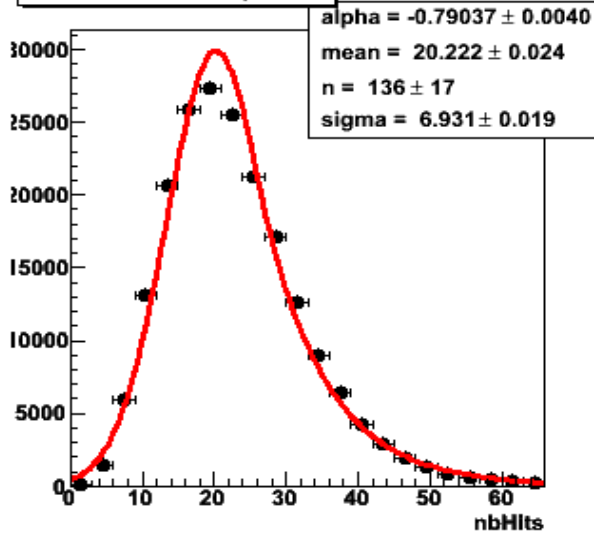


Pb abs: Dep. energy distributions

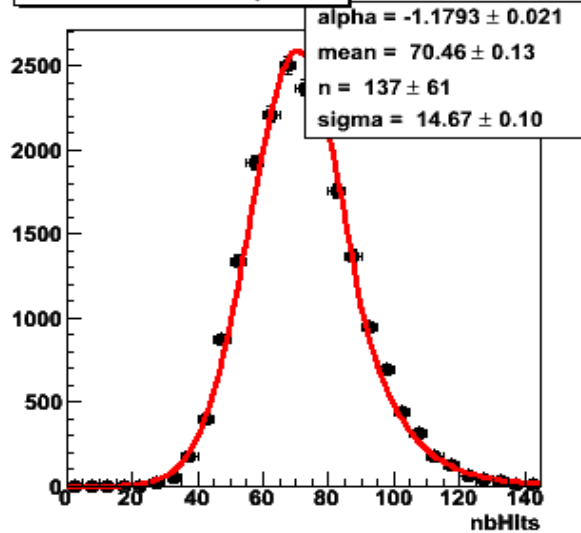


Pb abs: Hit distributions

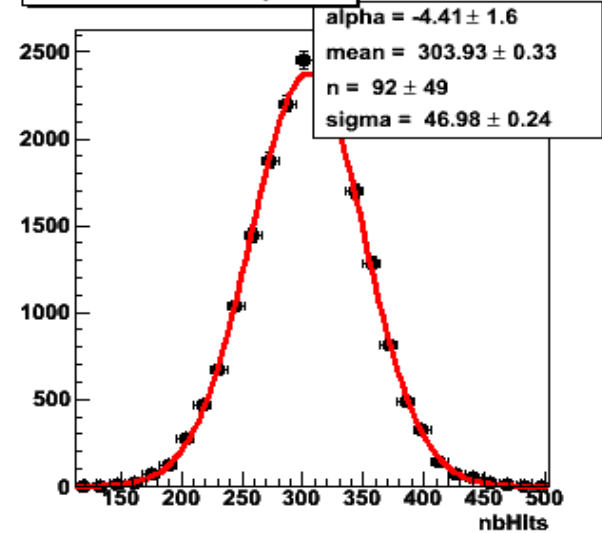
nbHits for 3 GeV pions



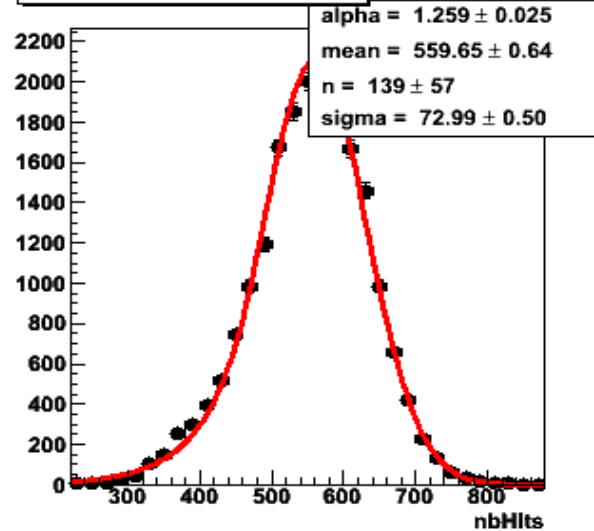
nbHits for 10 GeV pions



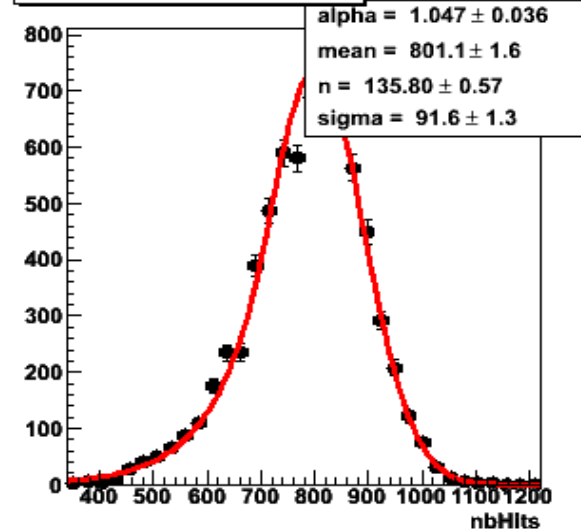
nbHits for 50 GeV pions



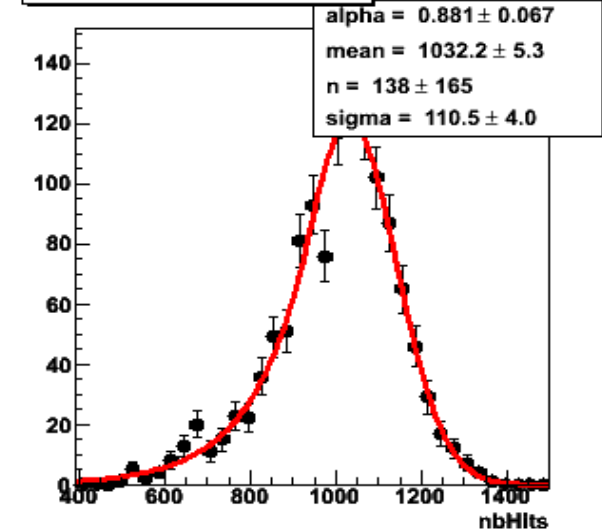
nbHits for 100 GeV pions



nbHits for 150 GeV pions

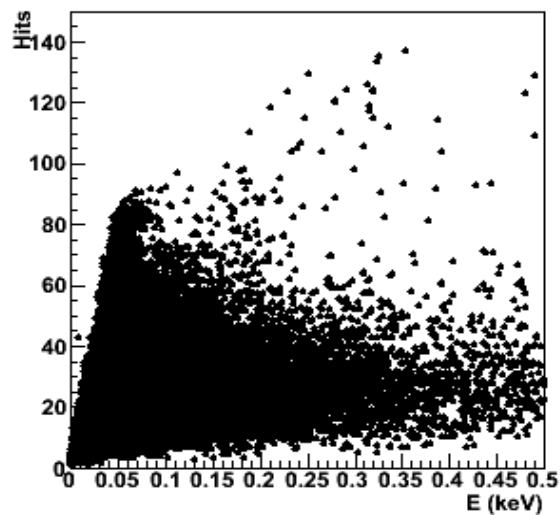


nbHits for 200 GeV pions

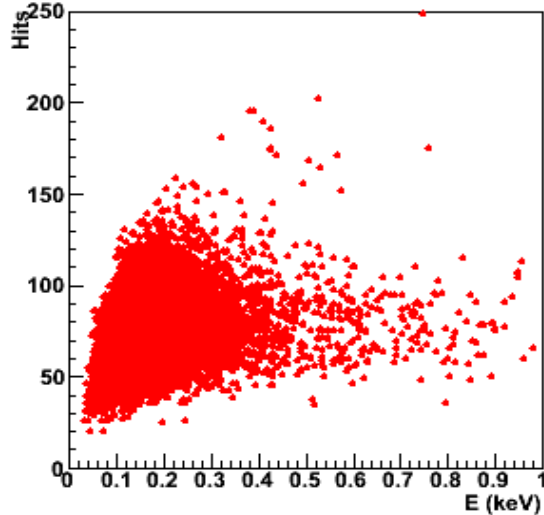


Pb abs: correlations

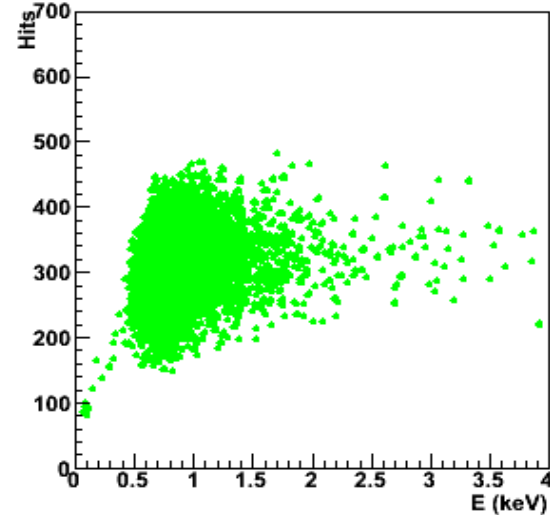
hDepEngVsHits3GeV



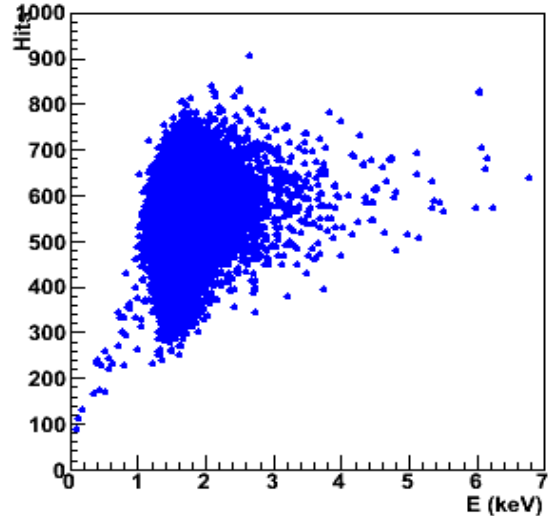
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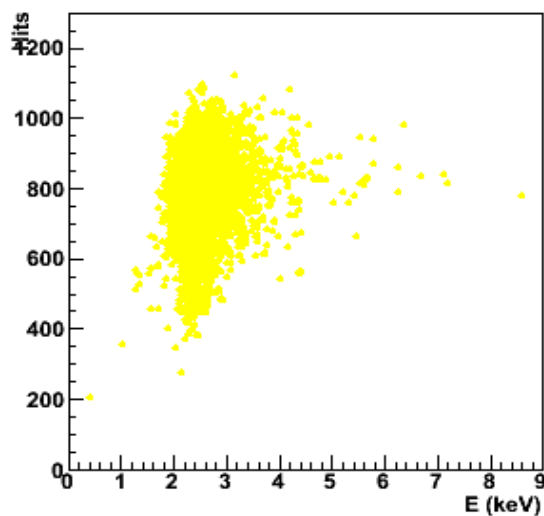
hDepEngVsHits50GeV



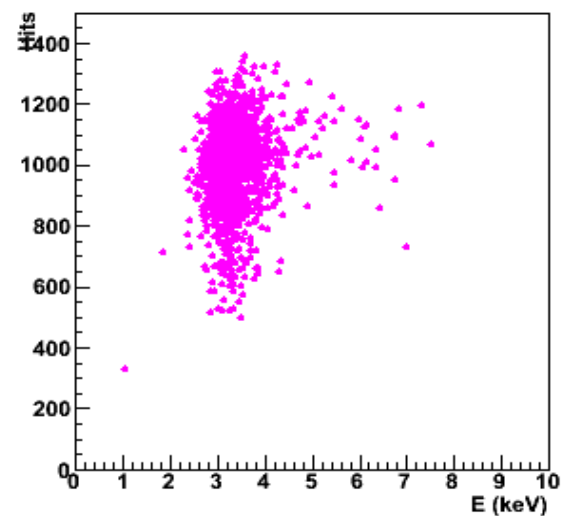
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hDepEngVsHits150GeV

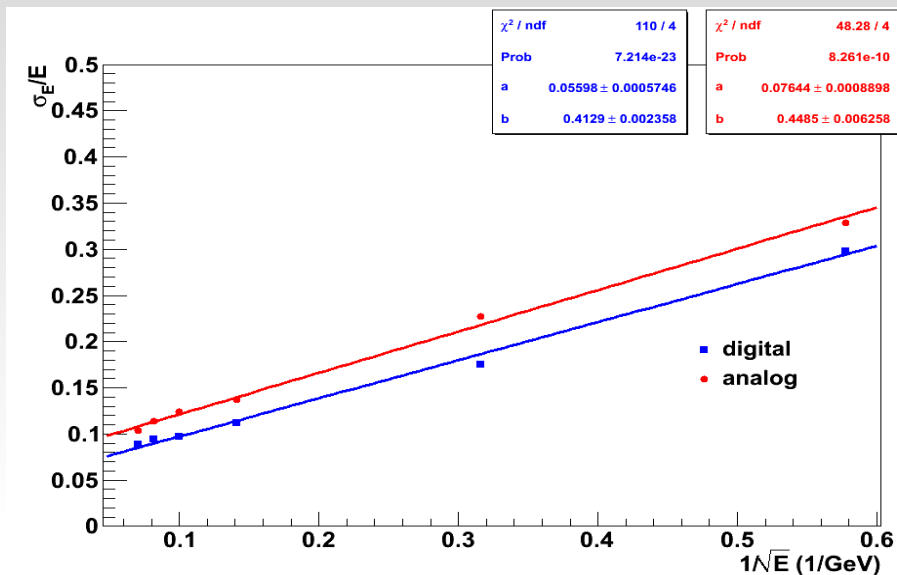


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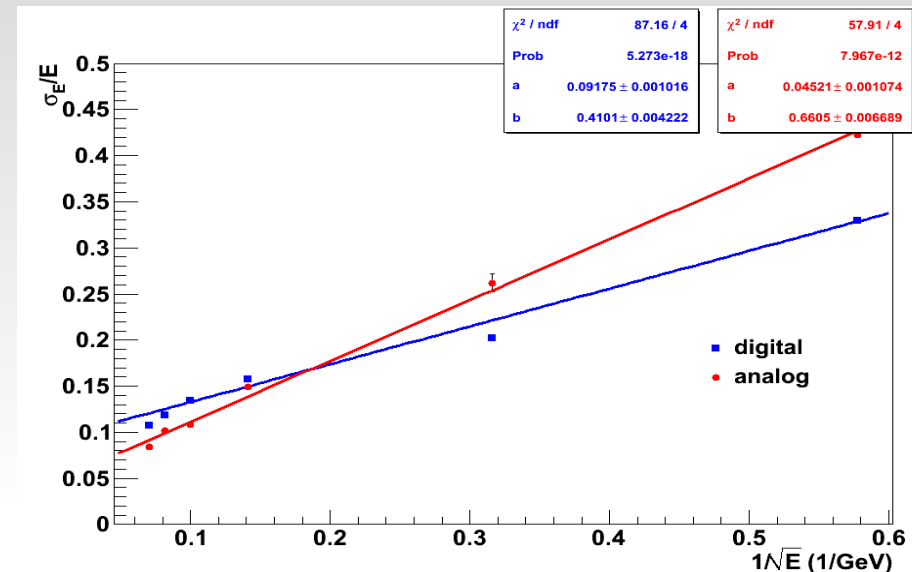


Energy resolution vs pion energy

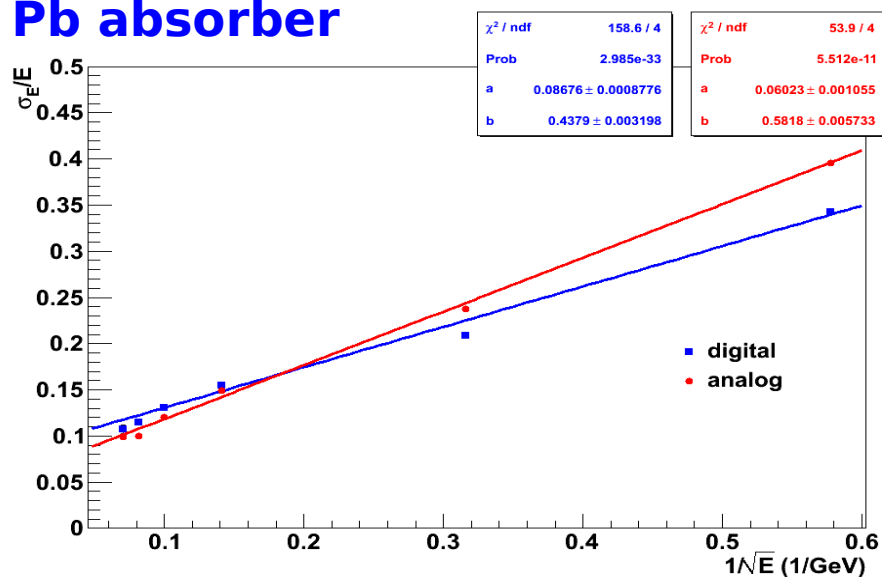
Fe absorber



W absorber



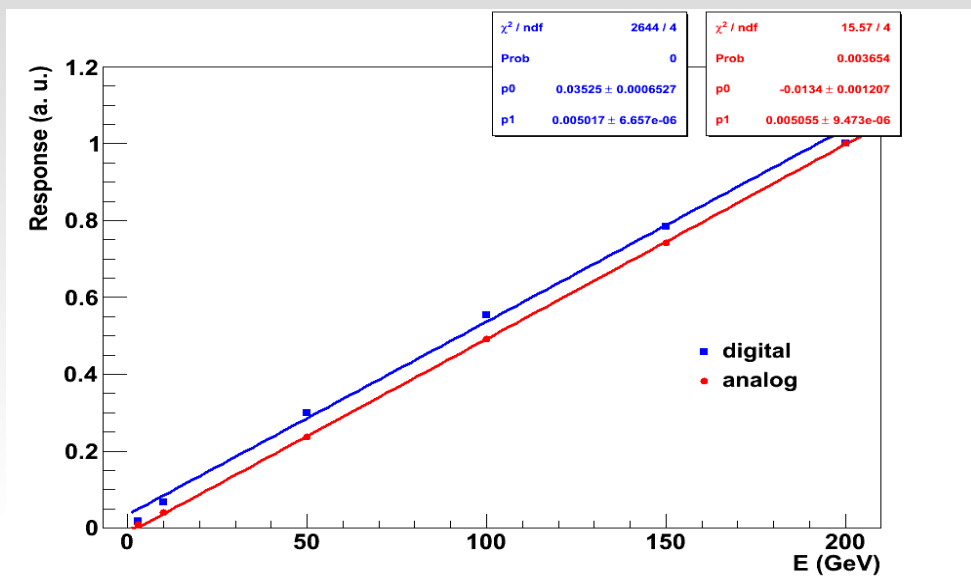
Pb absorber



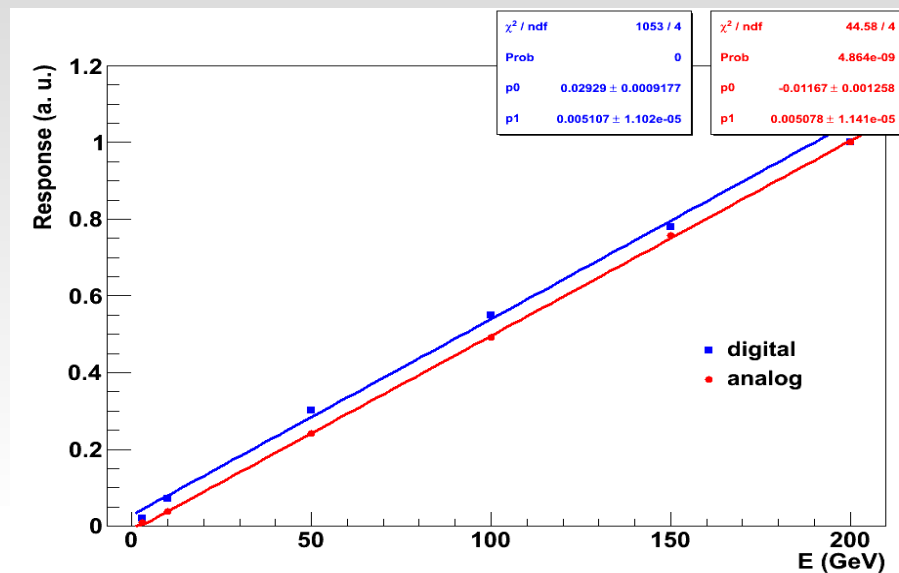
Abs	Readout	Constant (%)	Stochastic (%)
Fe	Digital	5.60 ± 0.06	41.29 ± 0.24
	Analog	7.64 ± 0.09	44.85 ± 0.63
W	Digital	9.18 ± 0.10	41.01 ± 0.42
	Analog	4.52 ± 0.12	66.05 ± 0.68
Pb	Digital	8.68 ± 0.09	43.79 ± 0.32
	Analog	6.02 ± 0.11	58.18 ± 0.58

Linearity

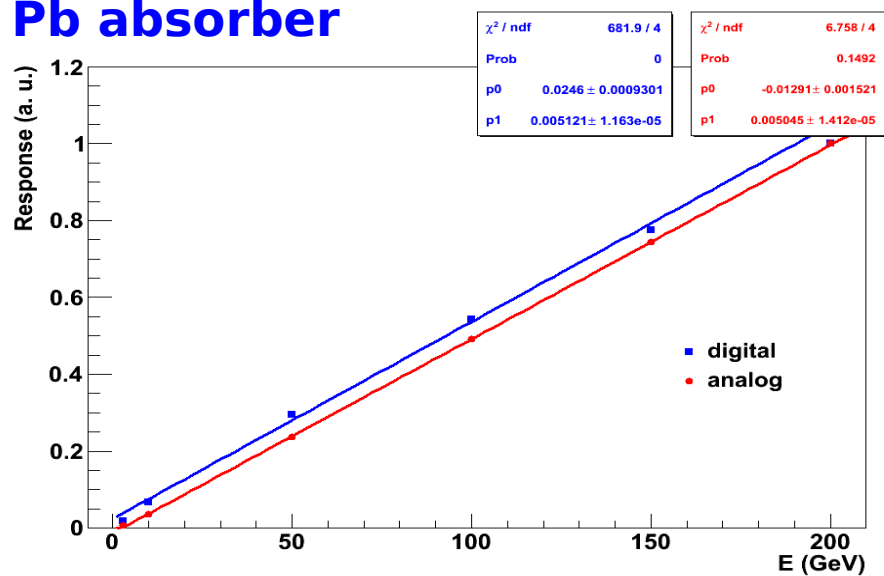
Fe absorber



W absorber

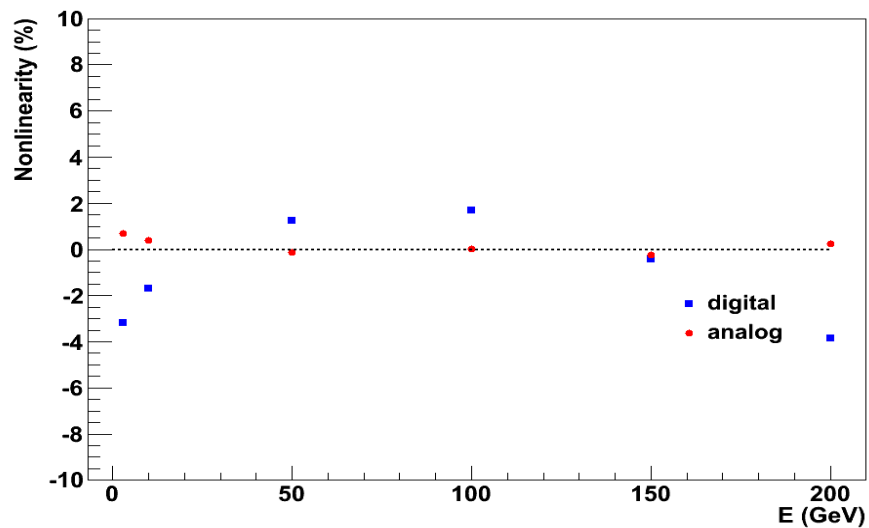


Pb absorber

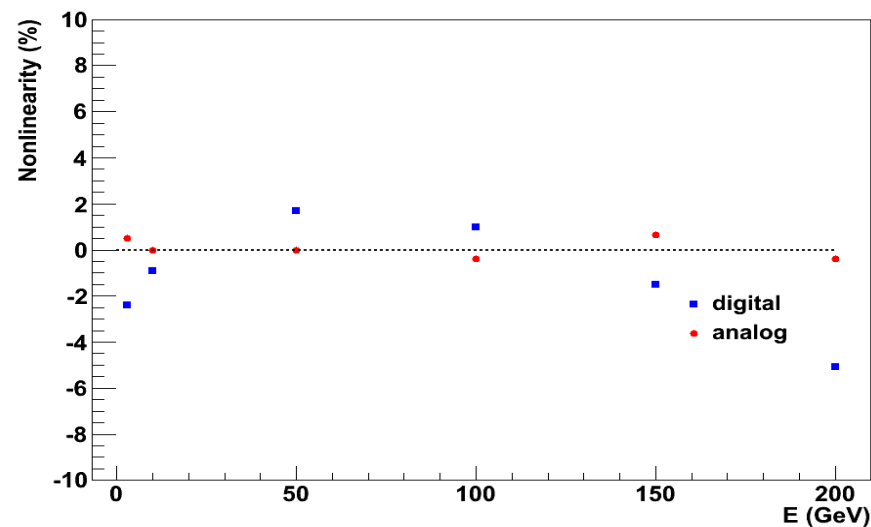


Nonlinearity

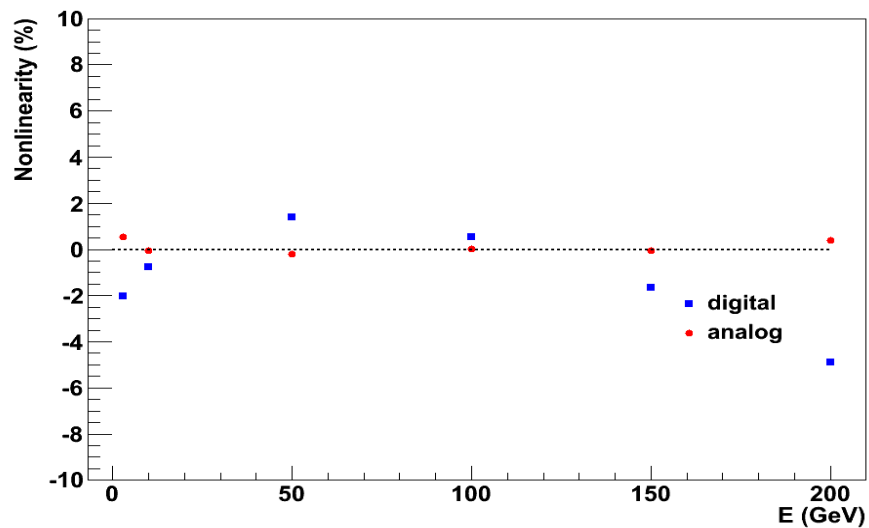
Fe absorber



W absorber



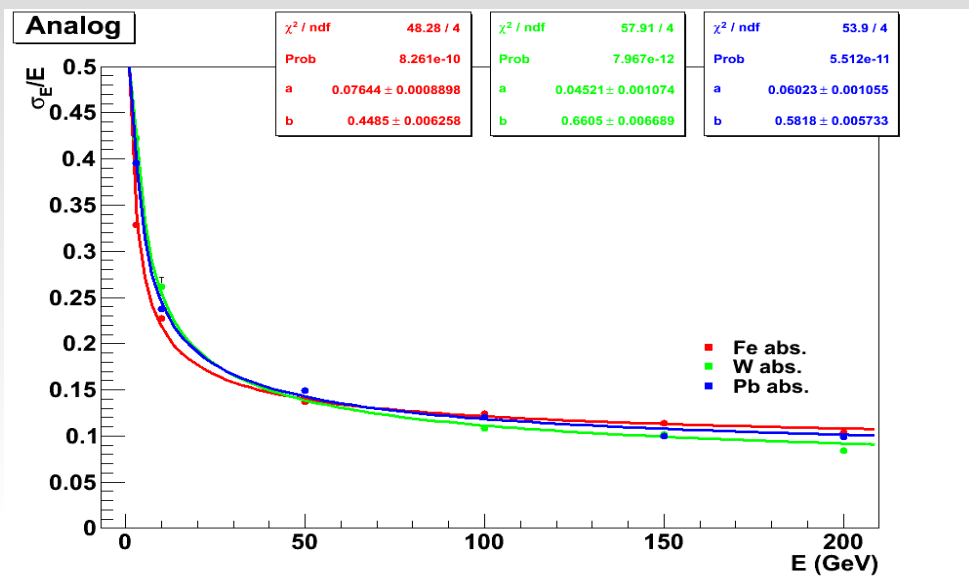
Pb absorber



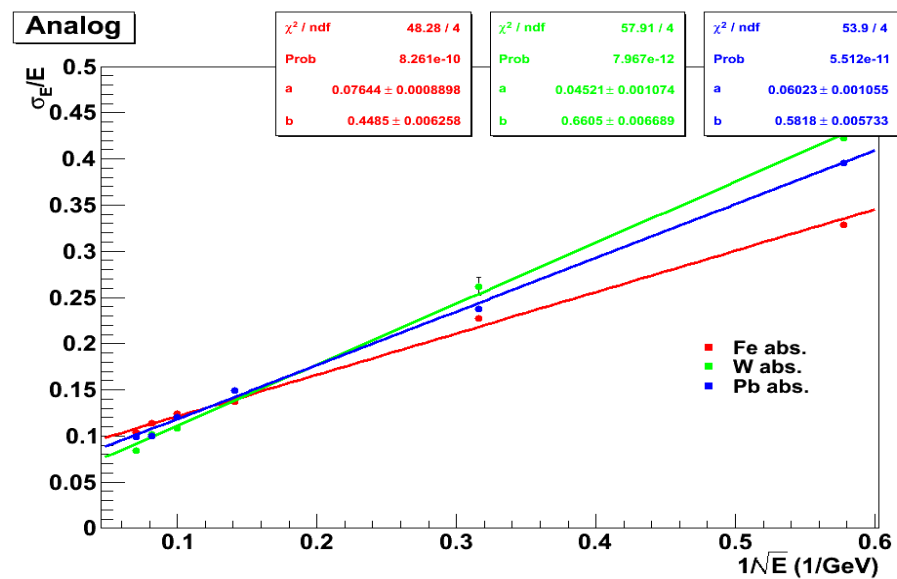
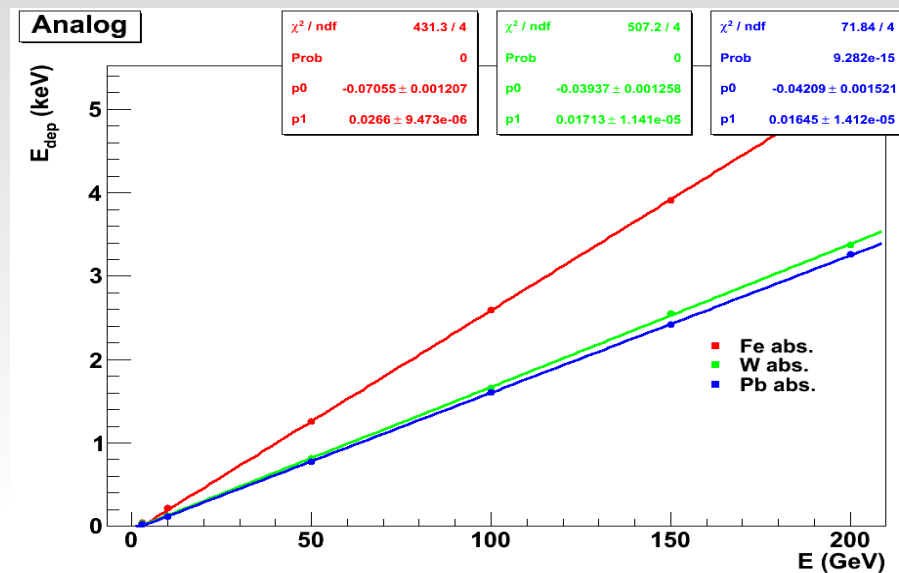
Analog readout is linear within 1%
Digital readout is linear within 4%

Analog readout

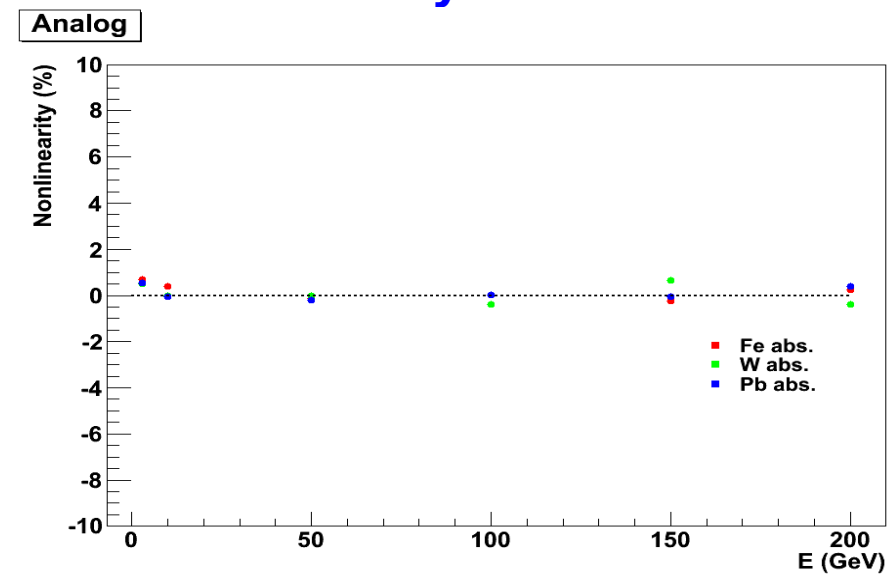
Resolution



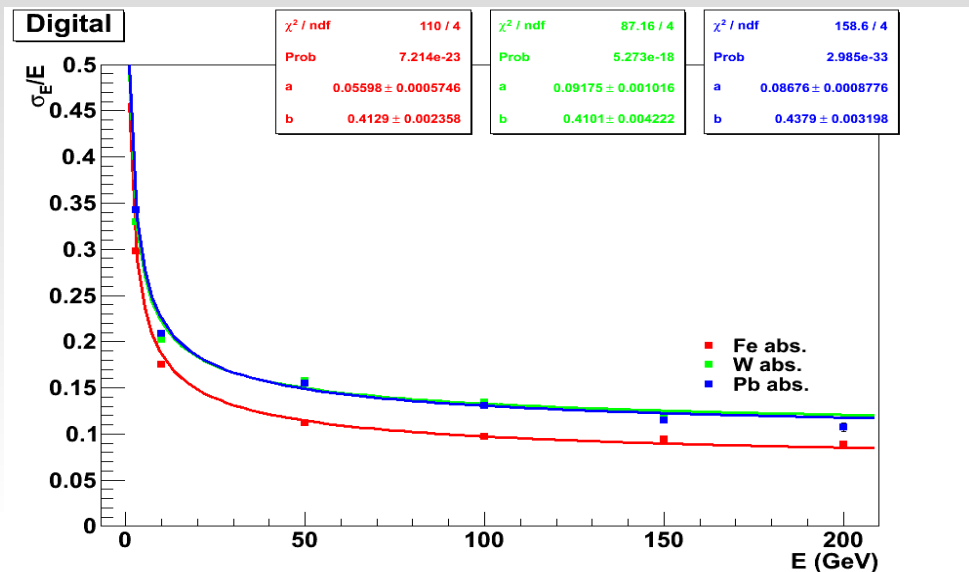
Linearity



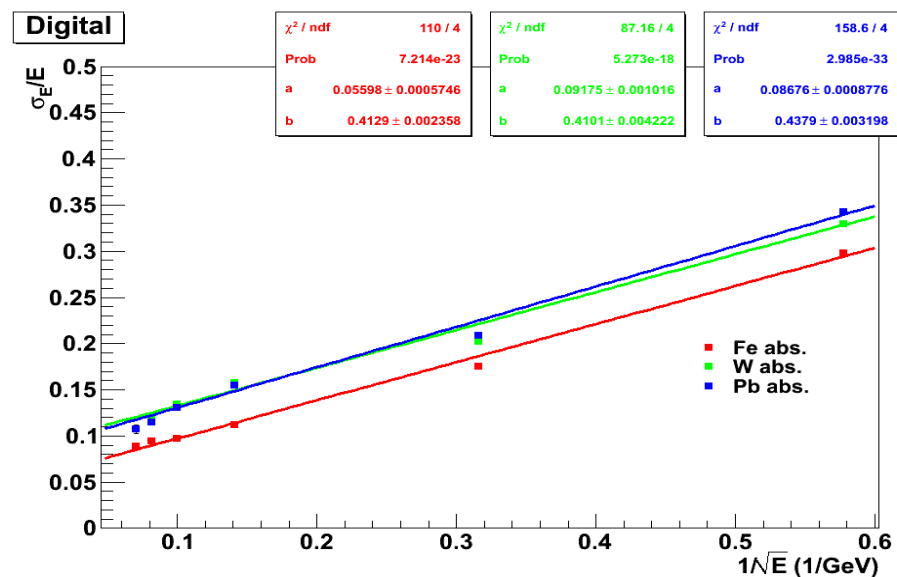
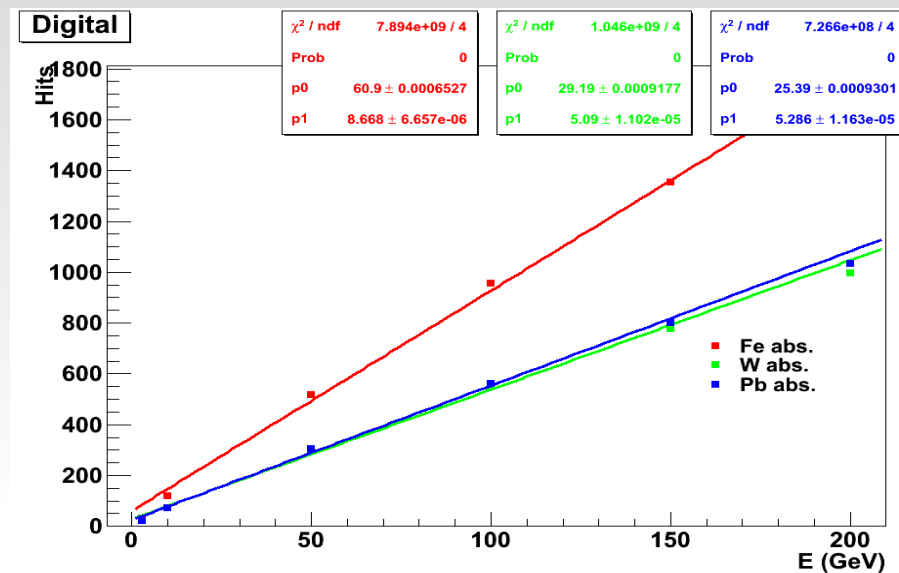
Nonlinearity



Resolution



Linearity



Nonlinearity

