

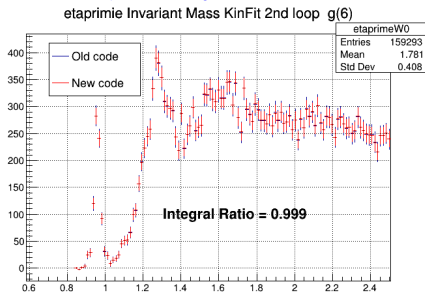
DSelector Uniqueness Tests

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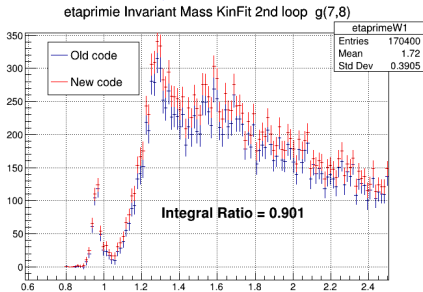
Compare DSelector Uniqueness Tests

- Both DSelectors have TWO loop approach
- OLD version: uses prompt beam photon ONLY as Weight modifier
- NEW version: uses any beam photon as Weight modifier separately
- Test with: $\gamma + p \rightarrow \pi^+ + \pi^- + 6\gamma + p$

FS with 6γ exactly: Same result



FS with 7 or 8γ : 10% difference!



New DSelector method

Statistics of η' peak:

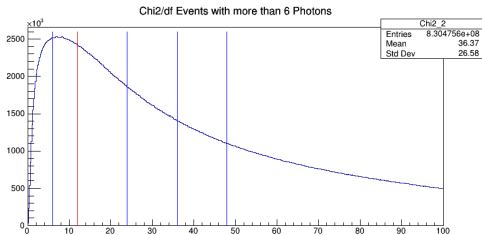
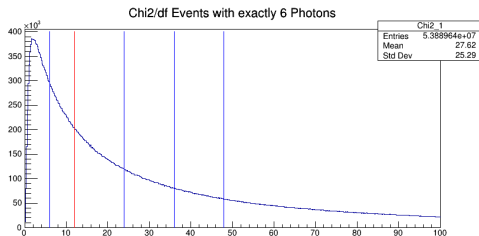
N_{γ} s	Weight	pos	σ	Integral
6	0	0.958	0.016	844.4
6	1	0.958	0.016	844.7
6	2	0.958	0.016	843.9
7,8	0	0.959	0.020	454.6
7,8	1	0.959	0.020	454.0
7,8	2	0.959	0.020	450.4

Weight: $0 = \frac{1}{N}$, $1 = \frac{\frac{1}{x_i^2}}{\sum \frac{1}{x_i^2}}$, $2 = \text{best } \chi^2$

Integral: $\pm 3\sigma$

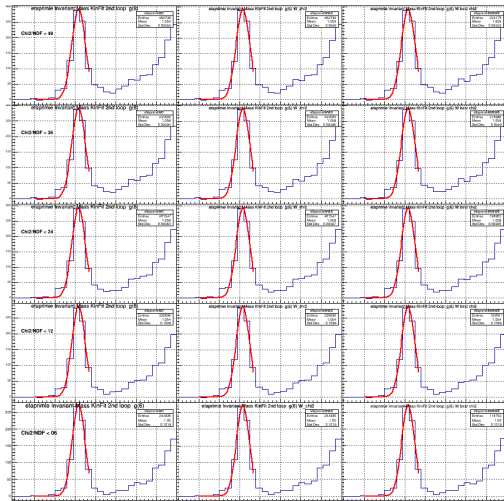
Simple Gaussian fit: fit range matters, in particular for 7,8 !

Test of χ^2 dependence



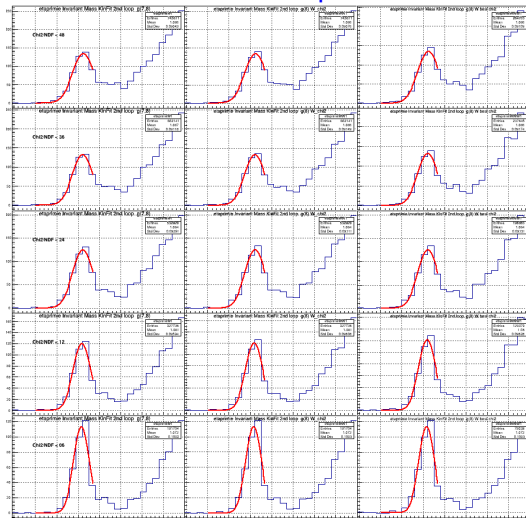
Test of χ^2 dependence

Events with exactly 6 photons:



Test of χ^2 dependence

Evens with more than 6 photons:



Test of χ^2 dependence

$N_{\gamma s}$	χ^2 / NDF	Weight	pos	σ	Integral
0	Chi2/NDF < 48	0	0.958	0.017	925.0
0	Chi2/NDF < 48	1	0.958	0.017	925.8
0	Chi2/NDF < 48	2	0.958	0.017	924.8
0	Chi2/NDF < 36	0	0.958	0.017	907.3
0	Chi2/NDF < 36	1	0.958	0.017	907.6
0	Chi2/NDF < 36	2	0.958	0.017	906.4
0	Chi2/NDF < 24	0	0.958	0.017	890.7
0	Chi2/NDF < 24	1	0.958	0.017	891.1
0	Chi2/NDF < 24	2	0.958	0.017	890.0
0	Chi2/NDF < 12	0	0.958	0.016	844.4
0	Chi2/NDF < 12	1	0.958	0.016	844.7
0	Chi2/NDF < 12	2	0.958	0.016	843.9
0	Chi2/NDF < 06	0	0.958	0.016	760.3
0	Chi2/NDF < 06	1	0.958	0.016	760.3
0	Chi2/NDF < 06	2	0.958	0.016	759.3
1	Chi2/NDF < 48	0	0.962	0.025	714.7
1	Chi2/NDF < 48	1	0.962	0.025	714.4
1	Chi2/NDF < 48	2	0.962	0.025	712.4
1	Chi2/NDF < 36	0	0.960	0.024	630.7
1	Chi2/NDF < 36	1	0.960	0.024	631.9
1	Chi2/NDF < 36	2	0.960	0.024	631.4
1	Chi2/NDF < 24	0	0.961	0.024	564.9
1	Chi2/NDF < 24	1	0.961	0.024	565.2
1	Chi2/NDF < 24	2	0.960	0.024	563.8
1	Chi2/NDF < 12	0	0.959	0.020	454.6
1	Chi2/NDF < 12	1	0.959	0.020	454.0
1	Chi2/NDF < 12	2	0.959	0.020	450.4
1	Chi2/NDF < 06	0	0.958	0.018	380.6
1	Chi2/NDF < 06	1	0.958	0.018	380.7
1	Chi2/NDF < 06	2	0.958	0.018	379.7