

Bologna: First approach on fitting program

- To understand/check the fitting program of Vincenzo → code reproduced
- code not deeply checked
- No evolution wrt Vincenzo code

Fragments:

Z	1	2	3	4	5	6	7	8
A	1	4	7	9	11	12	14	16
my	0	1	2	3	4	5	6	7

Standard Resolution: TOF → 100 ps;

$\sigma(p)/p = 4\%$ (tracker)

$\sigma(E)/E = 3\%$ (calo)

$\sigma(dE)/dE = 3\%$ (scint)

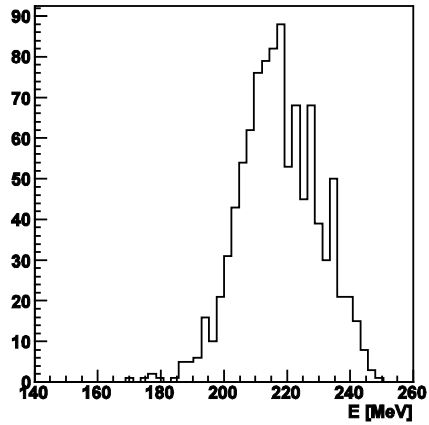
Starting point → Rootuple “kinetic_model_16O_C2H4_Mag_highThres.root”
taken tracks that travel all detector



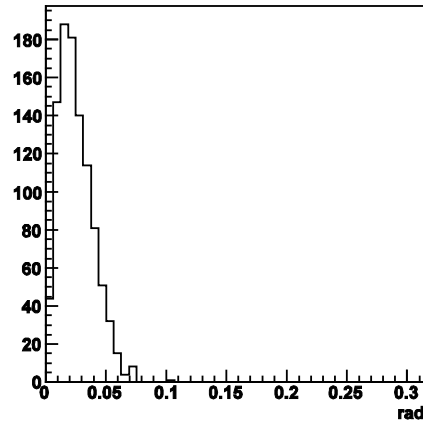
Kinetic Energy per nucleon, Theta and Phi generated with those distribution
and “reconstructed” with Gaussian smearing.

Generated quantities, fragment 5

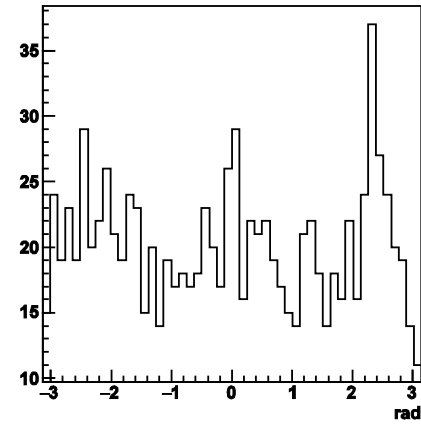
kine_energy per track C



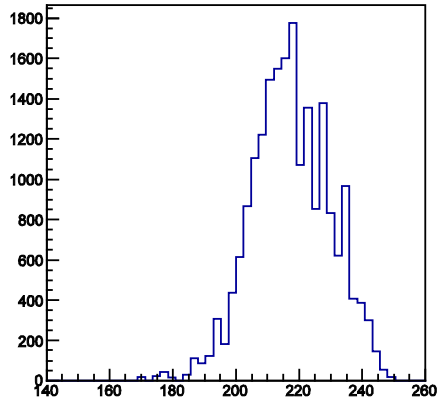
theta per track C



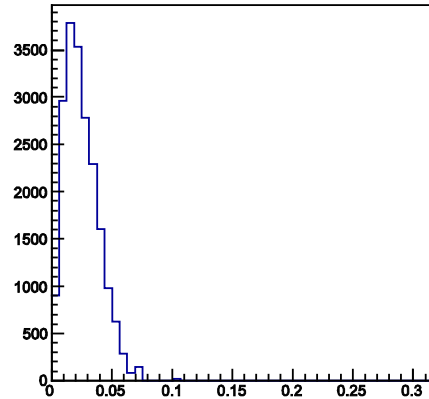
phi per track C



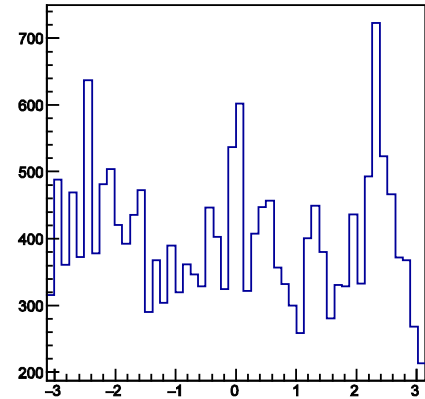
Ekin per nucl generated bin model



theta generated bin model



phi generated bin model

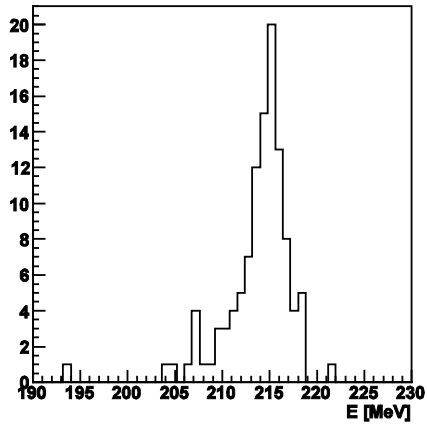


rootuple

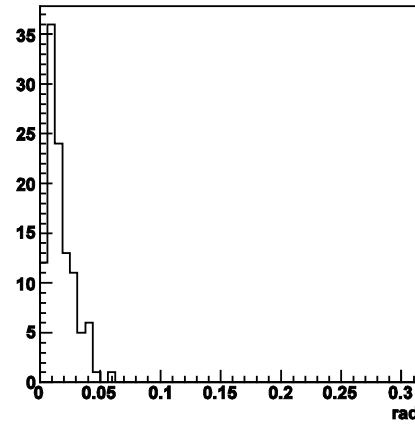
generation

Generated quantities, fragment 7

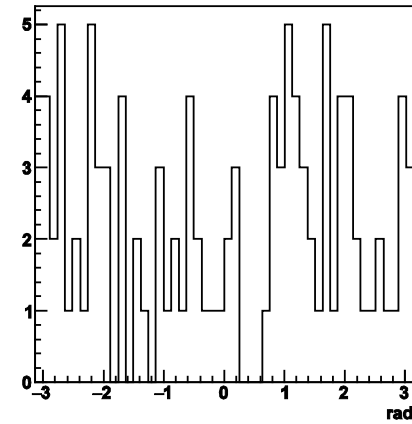
kine_energy per track O



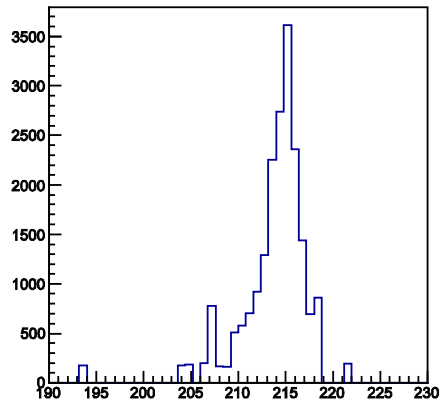
theta per track O



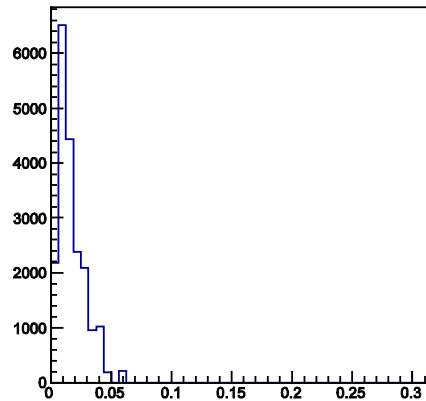
phi per track O



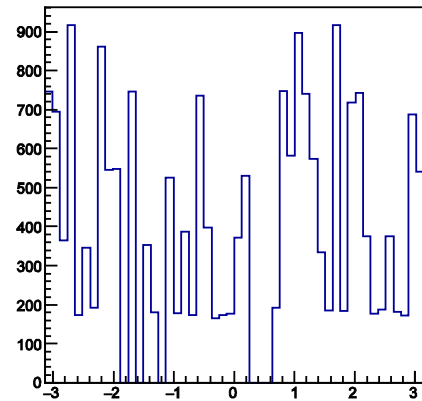
Ekin per nucl generated bin model



theta generated bin model



phi generated bin model



rootuple

generation

Statistics not so bad

Fit

Evaluate A in three different way:

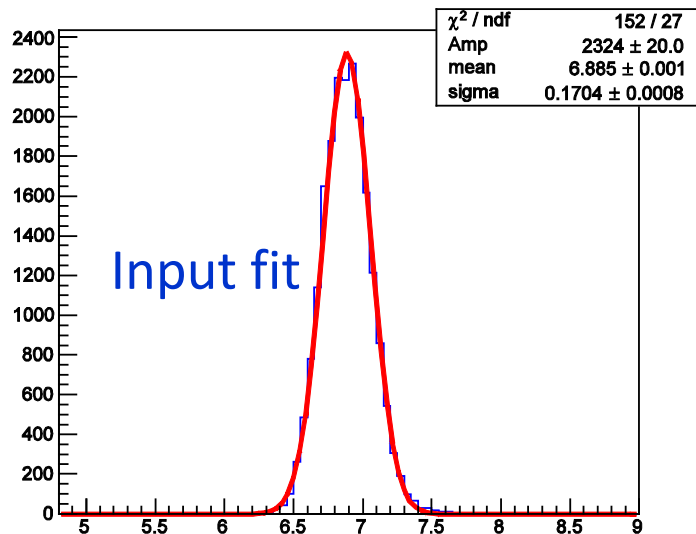
- TOF & TRACKER
- TOF & CALO
- TRACKER & CALO

AUGMENTED LAGRANGIAN FIT
PERFORMED BY VINCENZO

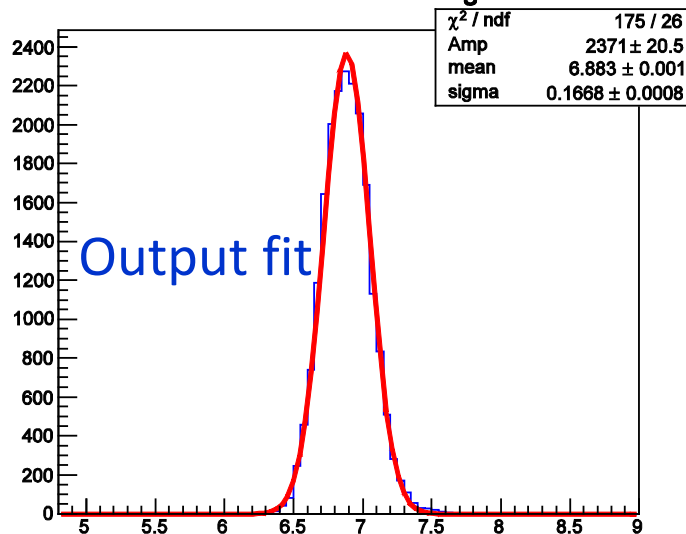
Number of fit parameters: 4 → measured TOF, momentum, E calo, mass
Number of constraints: 3 → mass evaluated as above

Fit outputs: TOF

TOF reconstruction

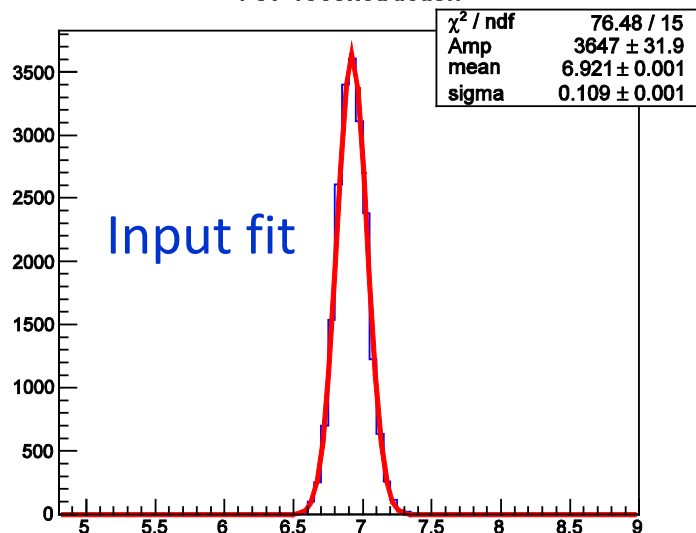


TOF reco after fitting

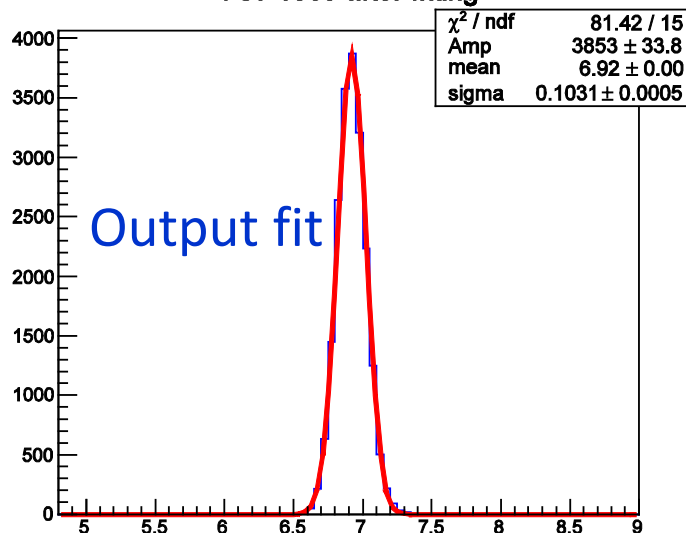


Fragment 5

TOF reconstruction



TOF reco after fitting

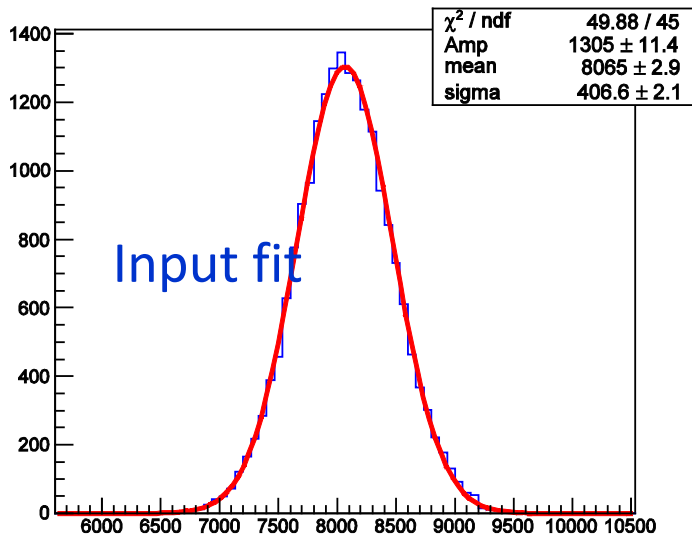


Fragment 7

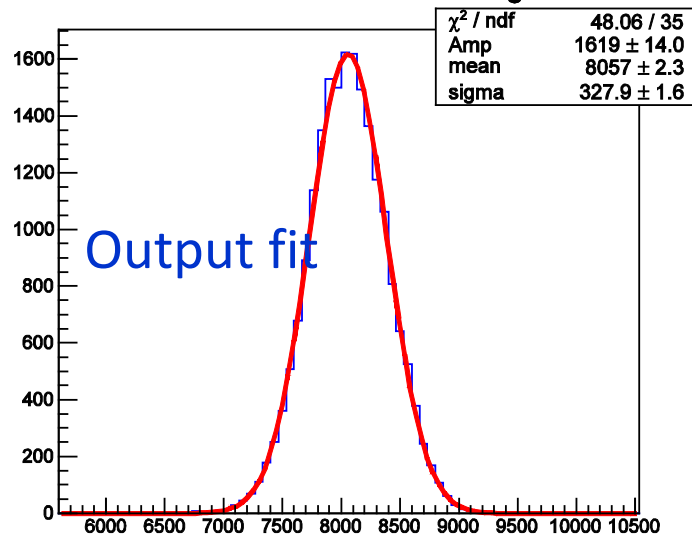
The 2 sigmas differ at % level

Fit outputs: momentum

Momentum reconstruction

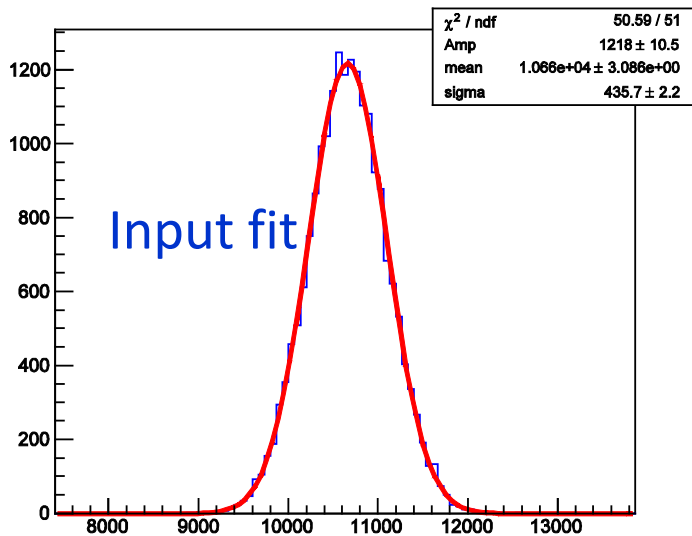


Momentum reco after fitting

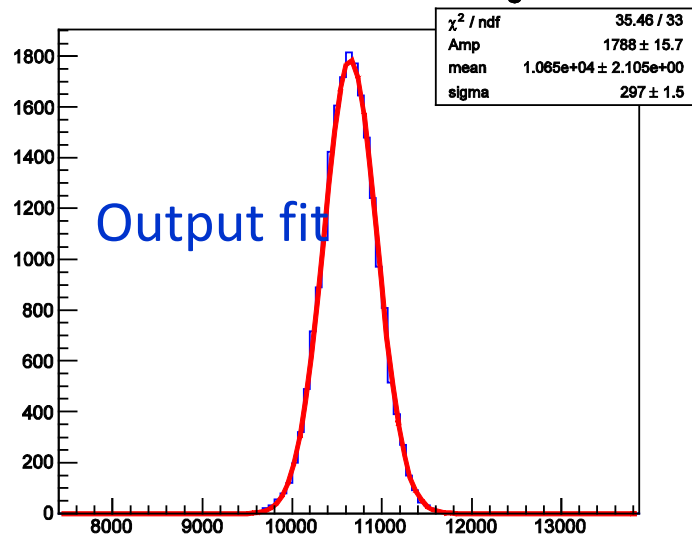


Fragment 5

Momentum reconstruction



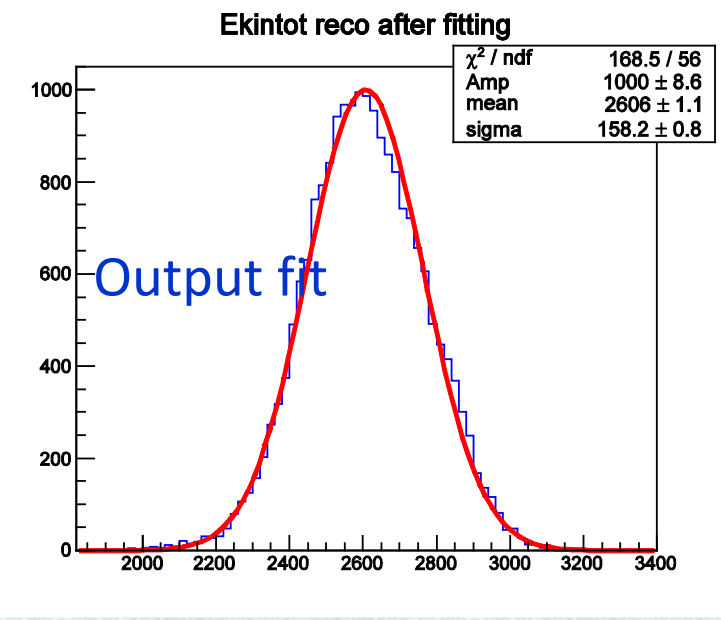
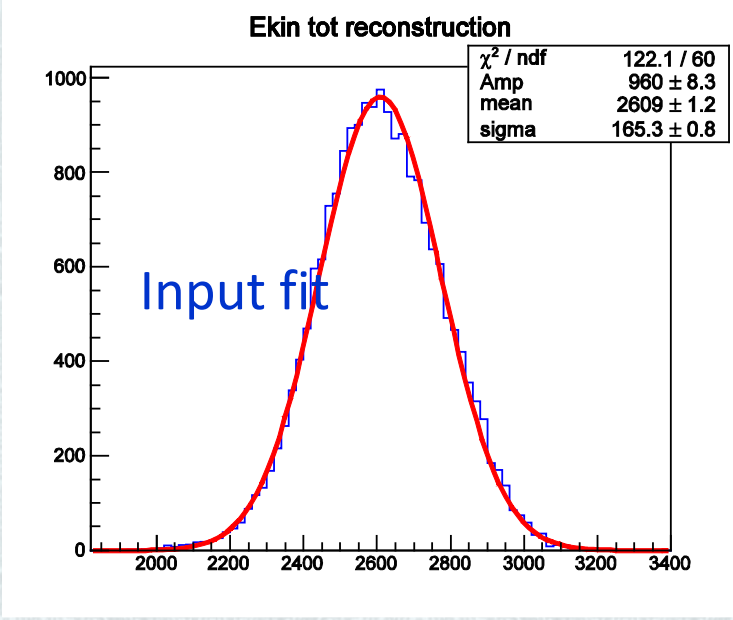
Momentum reco after fitting



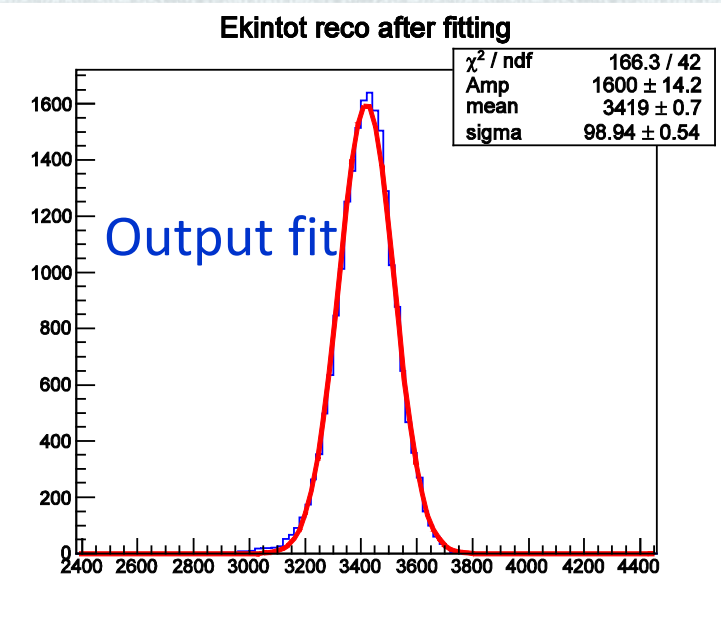
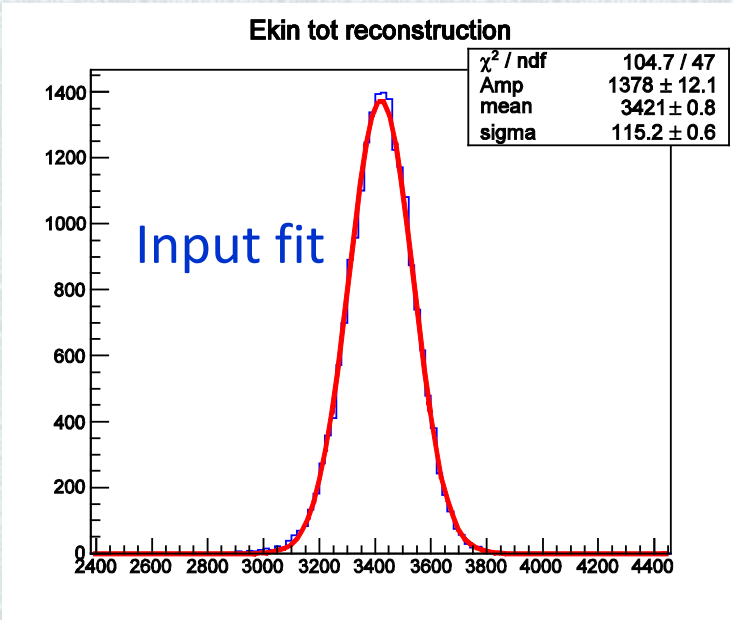
Fragment 7

The 2 sigmas differ ~ 20% (or more) level

Fit outputs: E calo



Fragment 5

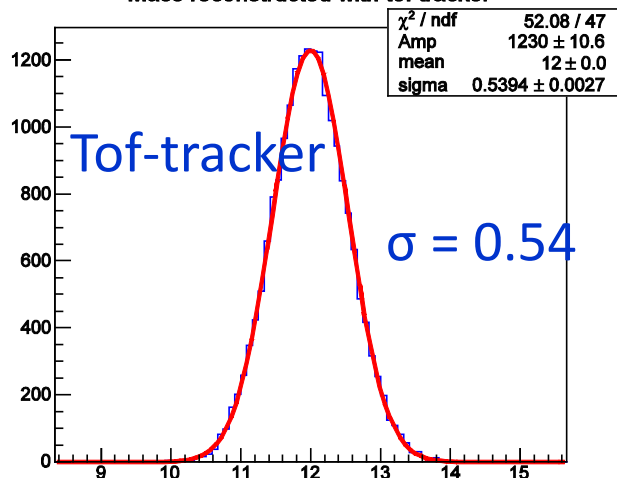


Fragment 7

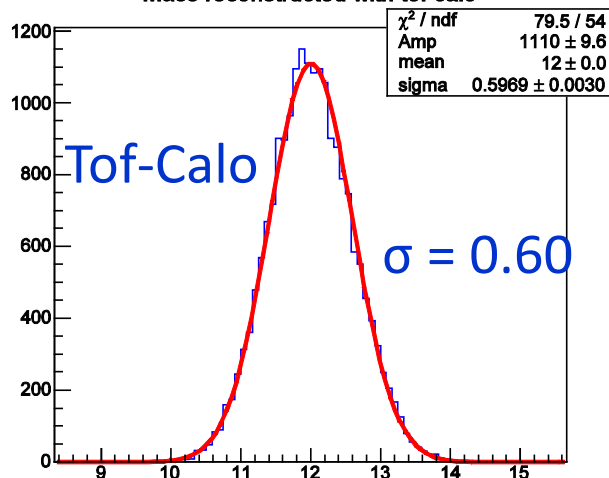
The 2 sigmas differ 10-20% (or more) level

Fit outputs: A fragment 5

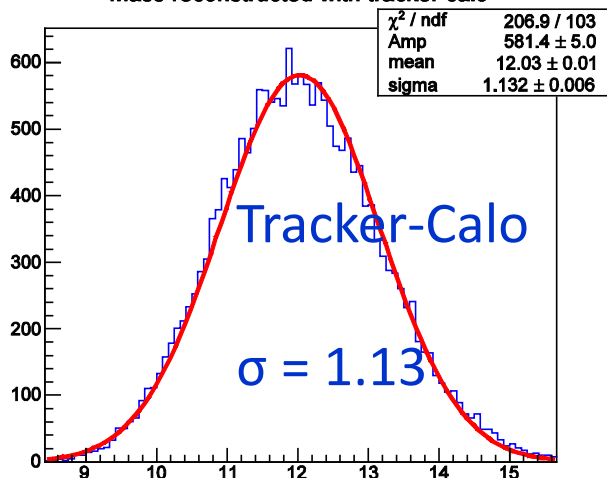
Mass reconstructed with tof tracker



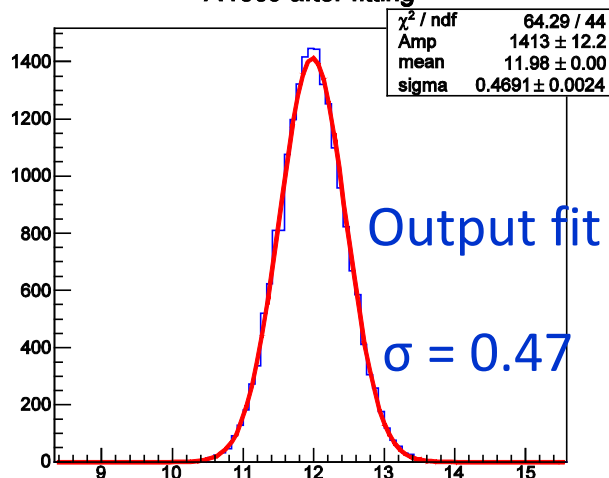
Mass reconstructed with tof calo



Mass reconstructed with tracker calo



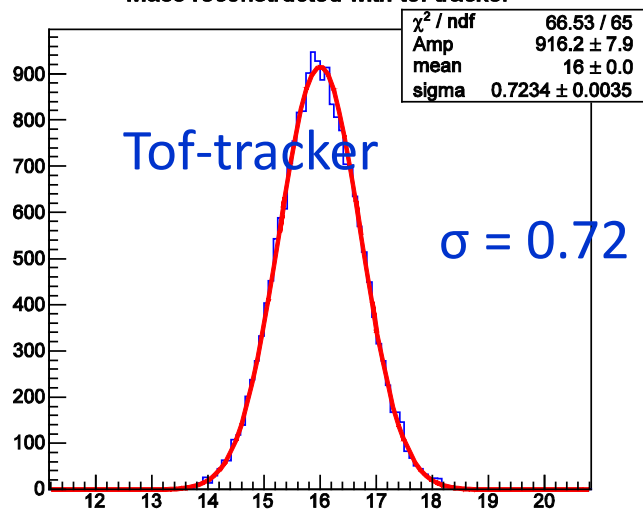
A reco after fitting



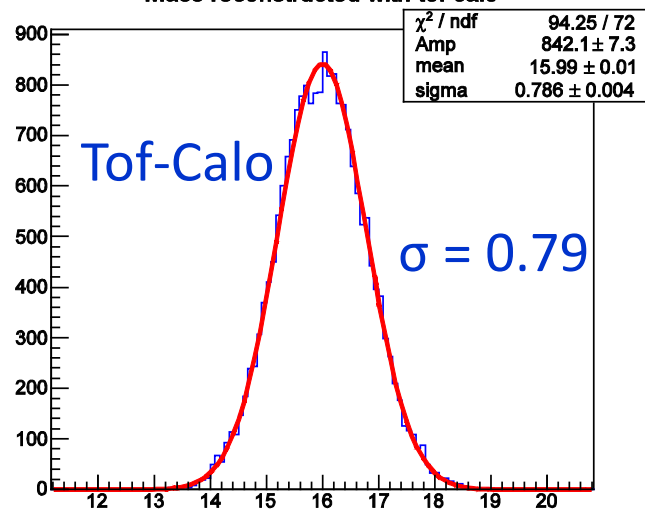
The fit improve the precision

Fit outputs: A fragment 7

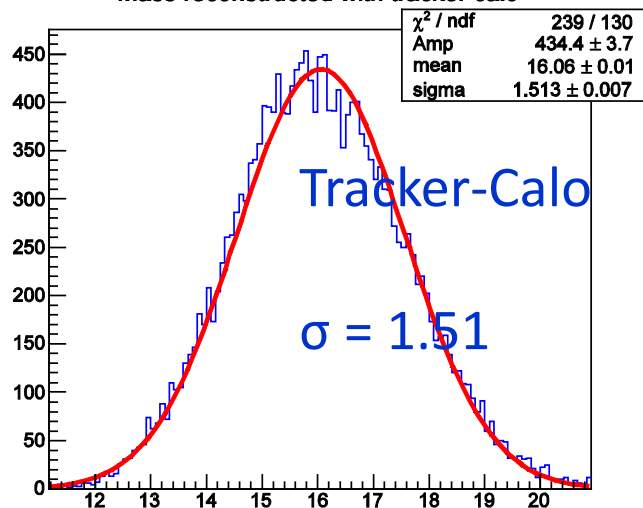
Mass reconstructed with tof tracker



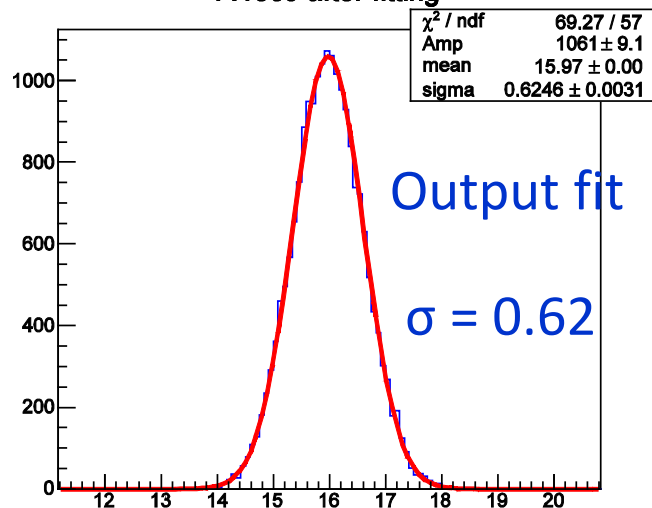
Mass reconstructed with tof calo



Mass reconstructed with tracker calo



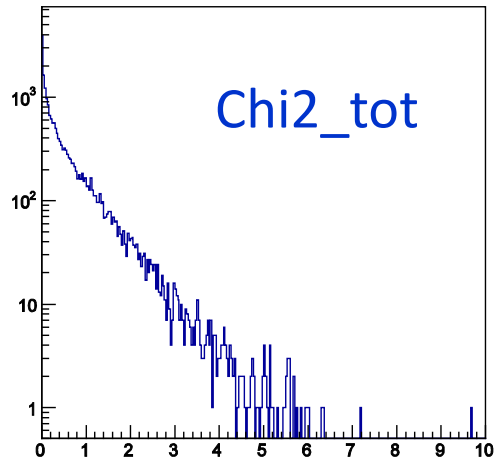
A reco after fitting



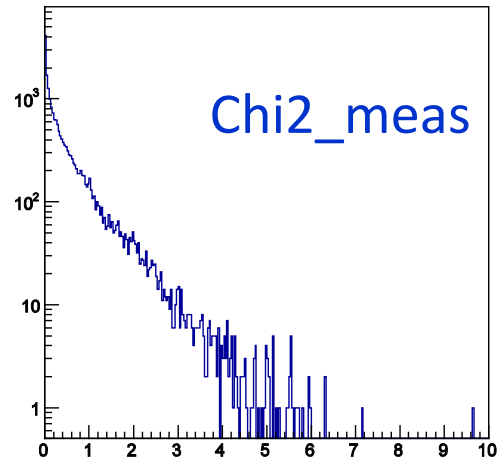
The fit improve the precision

Fit chi2: fragment 5

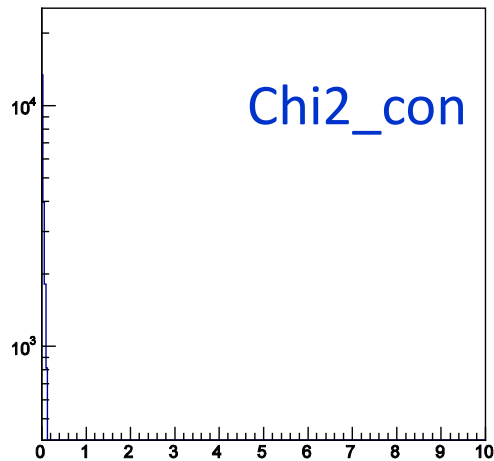
Chi2 Total



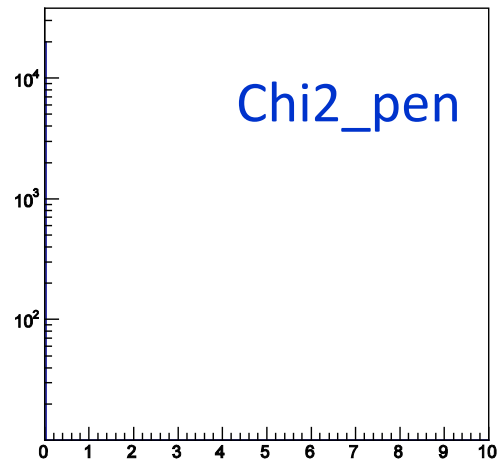
Chi2 on measurement quantities



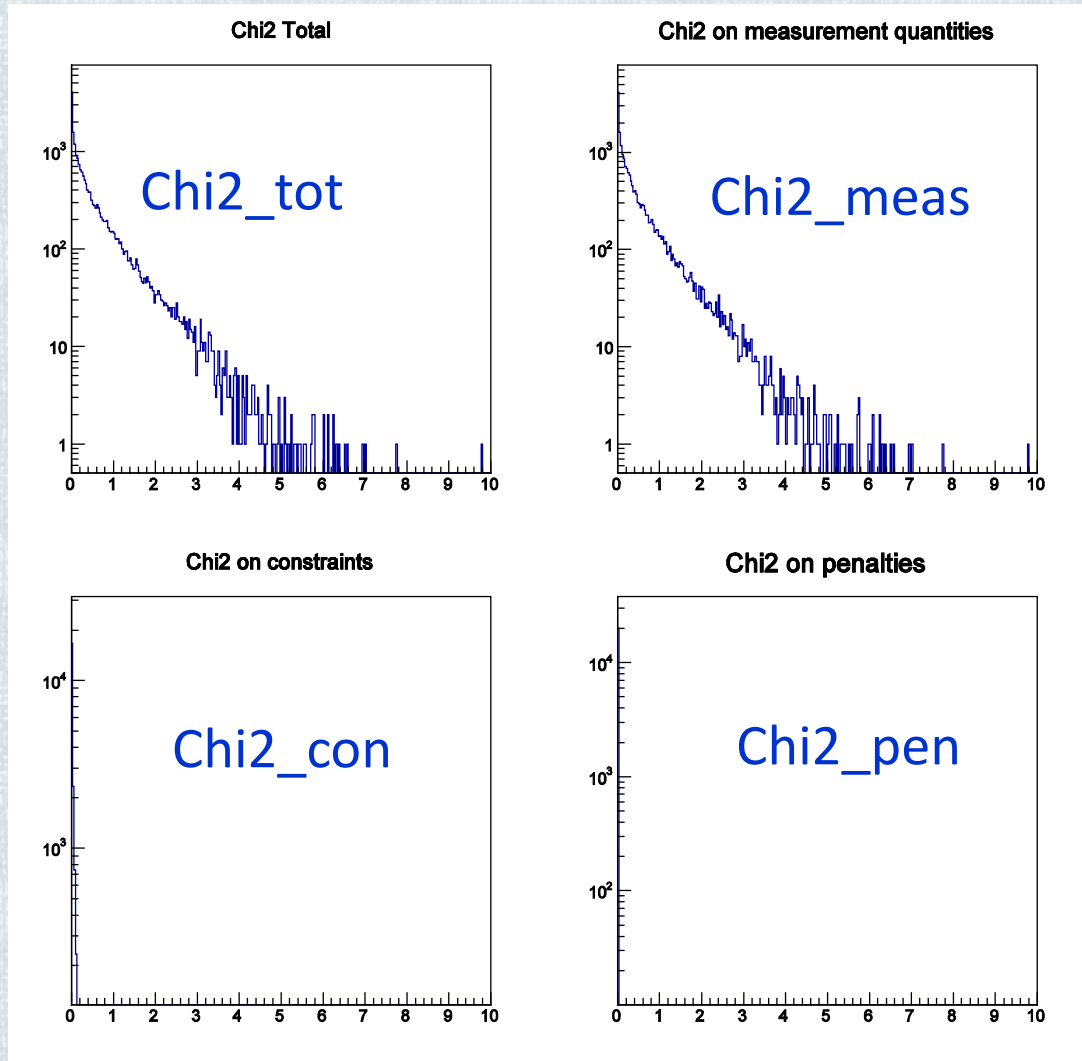
Chi2 on constraints



Chi2 on penalties



Fit chi2: fragment 7



FUTURE: Manage all the input parameter to answer to all questions of referees.