Subject: correction in emc bump splitting
Posted by Dima Melnychuk on Tue, 13 Jan 2009 03:10:21 GMT
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Hi all,

I have corrected the small bug in emc code which affected bump splitting and particularly calculation of the bump position. (rev.4314)

The energy of the bumps was calculated properly but to suppress merged pi0, we need not only energies of the bumps but also opening angle of pi0. And the bug in the calculation of bump position resulted in wrong opening angle and as a result in low efficiency of the merged pi0 suppression.

The pictures below gives some demonstration of the bump splitting for 200 event, 5 GeV pi0 generated in [30;60] degree theta range.

The following picture presents the MC Truth energy of gamma's from pi0 decay and reconstructed energy of EmcClusters.

The same for EmcBumps

i.e. the energy distribution is reproduced.

The opening angle of pi0 for MC Truth and EmcClusters

And reconstructed opening angle for EmcBumps

And finally pi0 invariant mass for EmcClusters

and EmcBumps

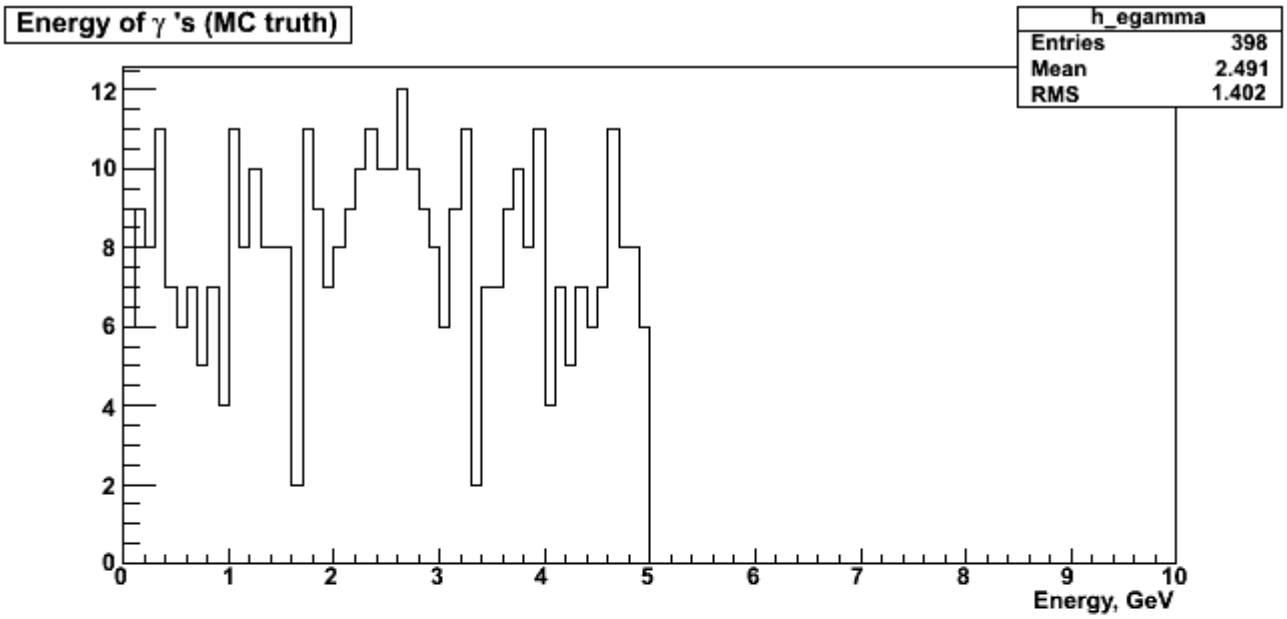
i.e. without bump splitting only 10 % of pi0 are reconstructed.

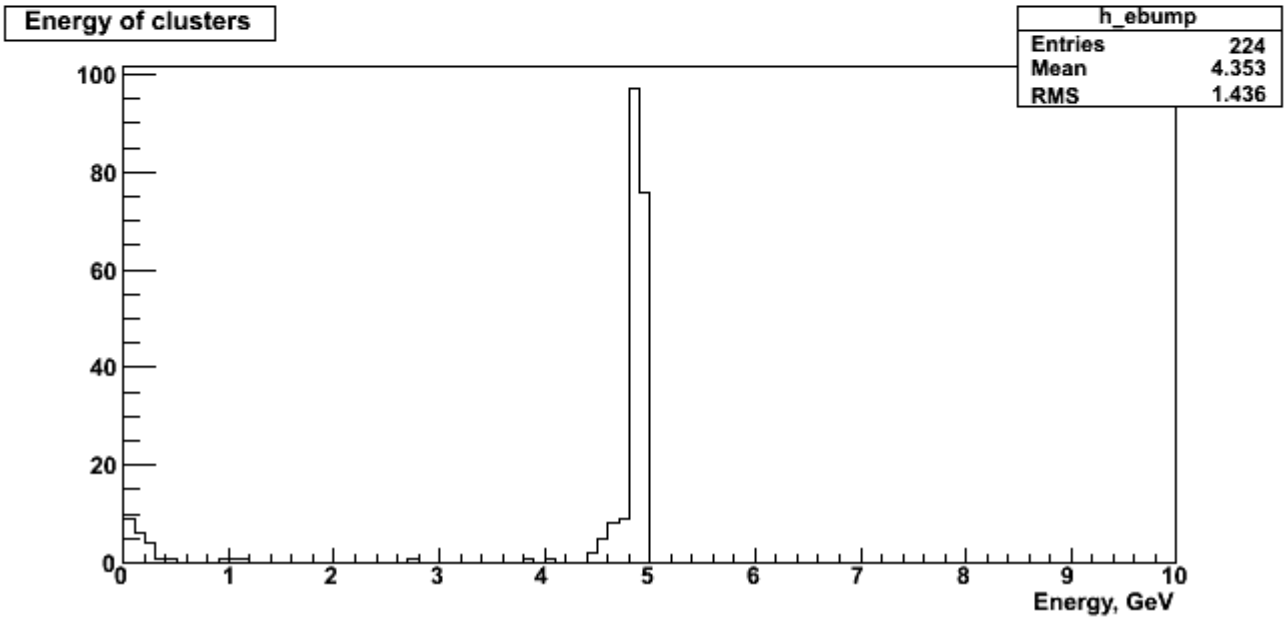
All the pictures are plotted with bump_analysis.C macro.

Best regards,
Dima

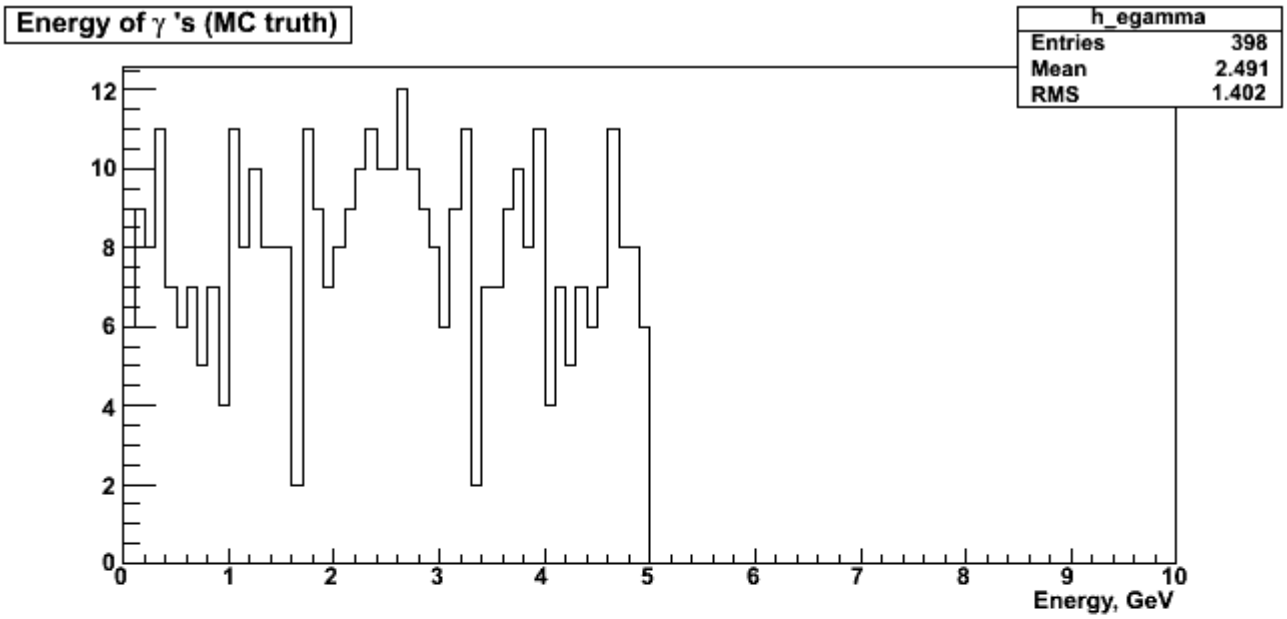
File Attachments

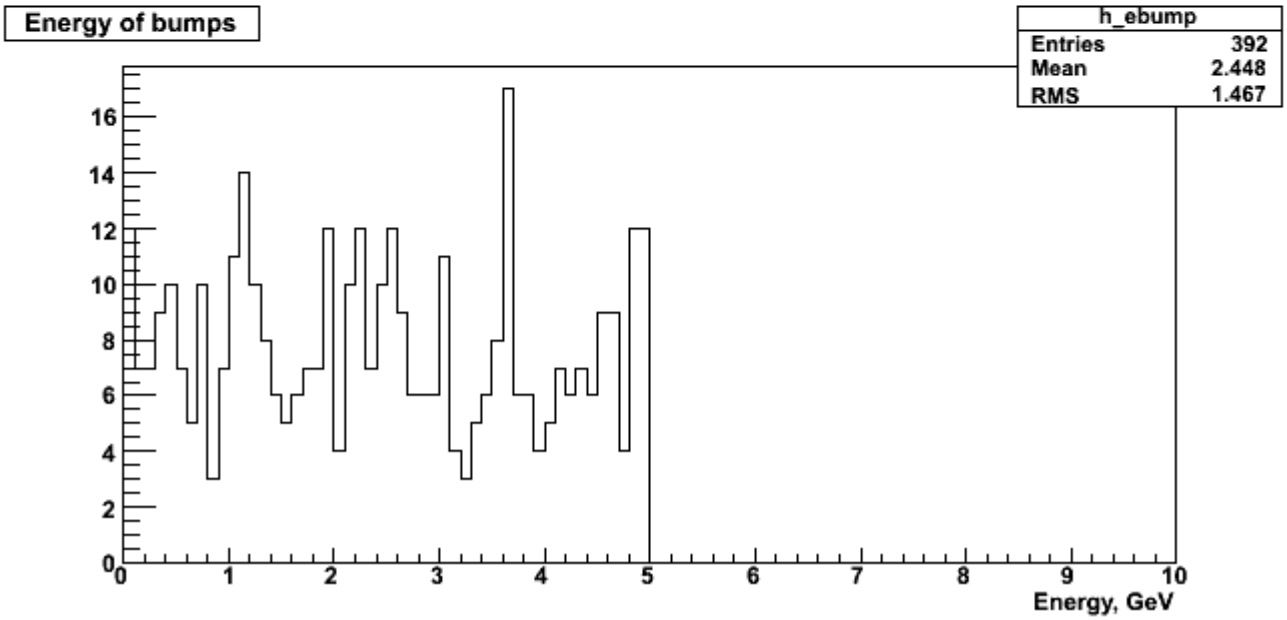
1) egamma_cluster.png, downloaded 1939 times



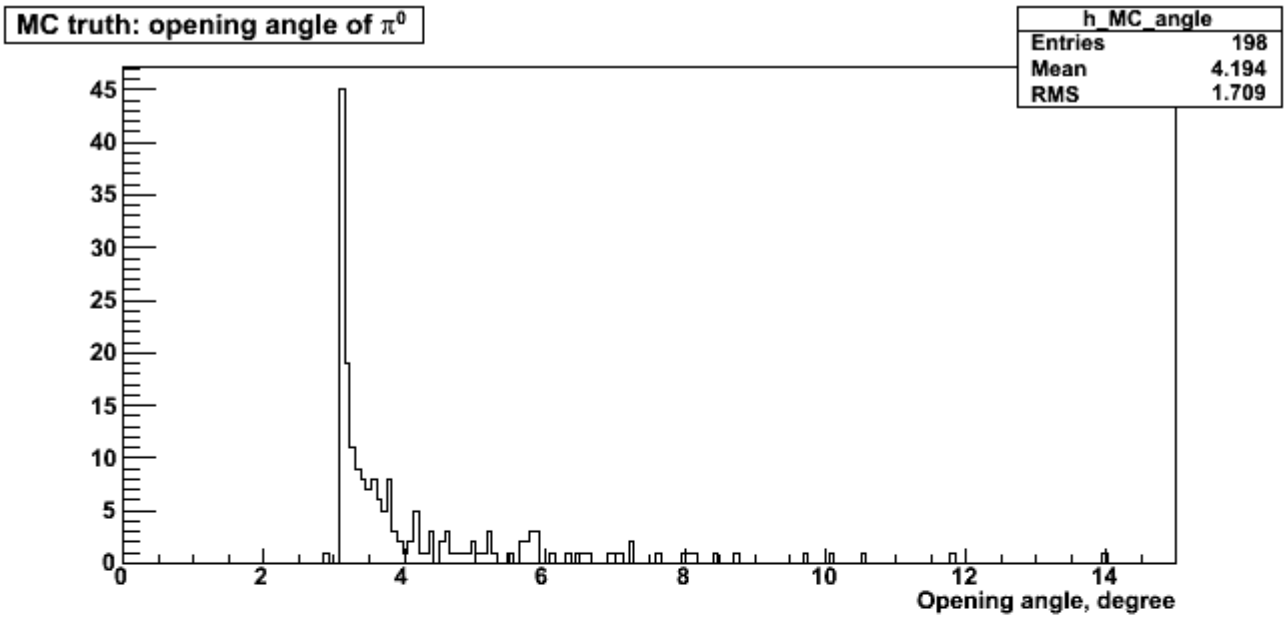


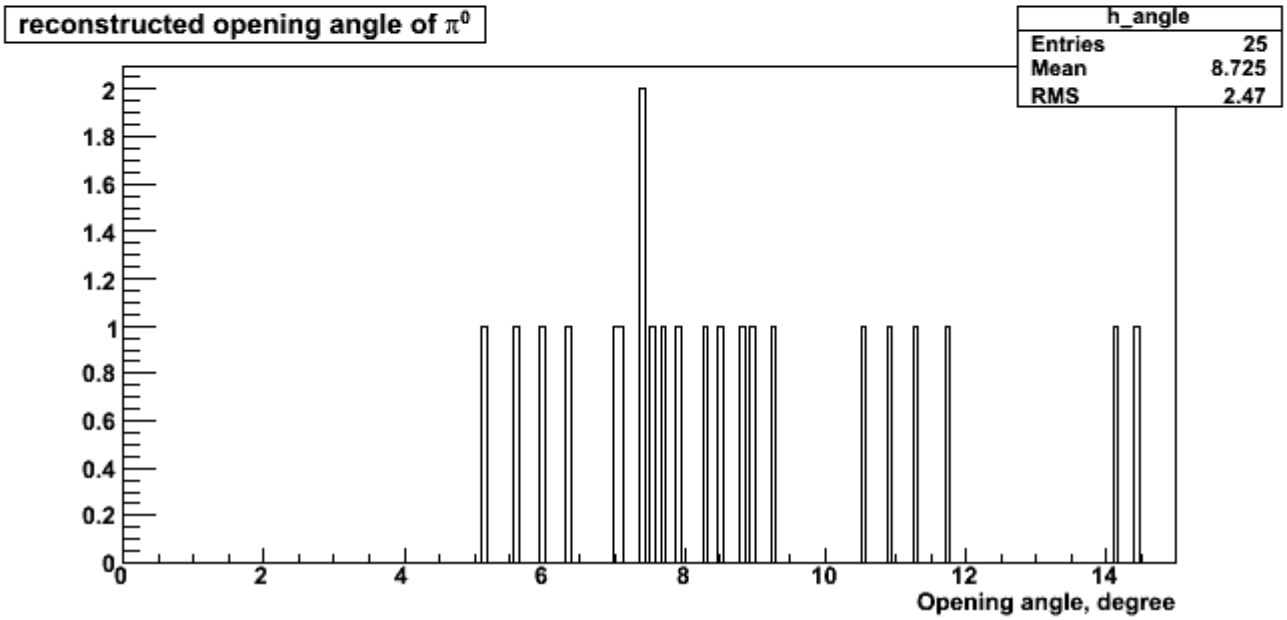
2) egamma_bump.png, downloaded 1951 times



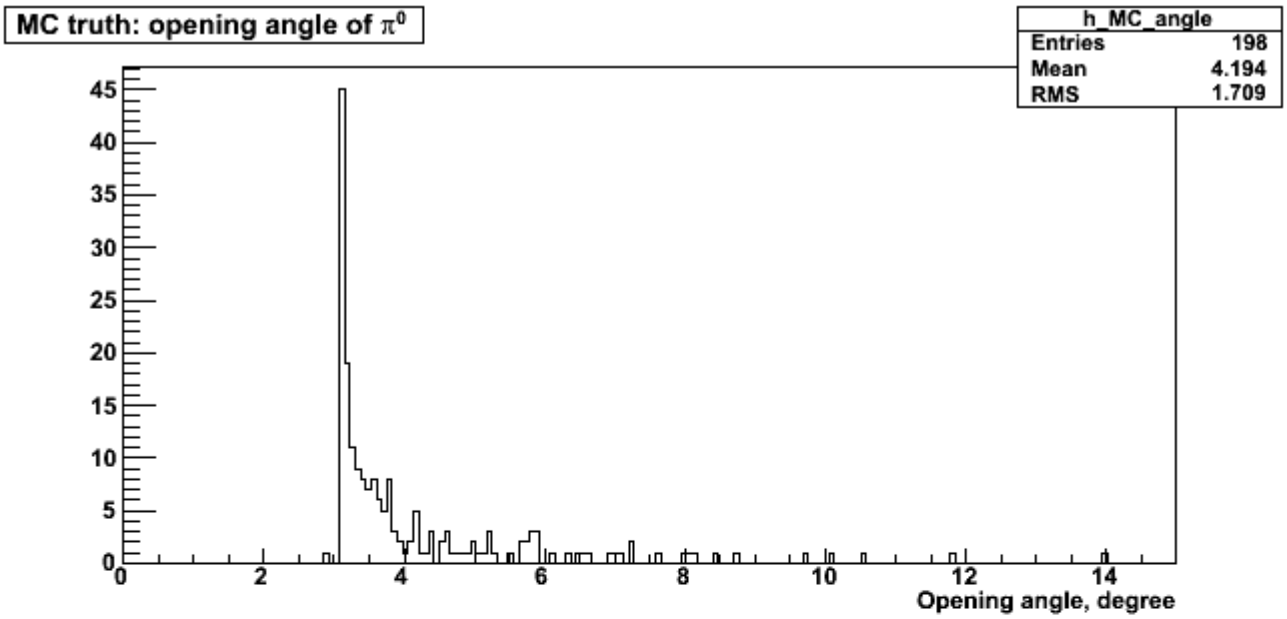


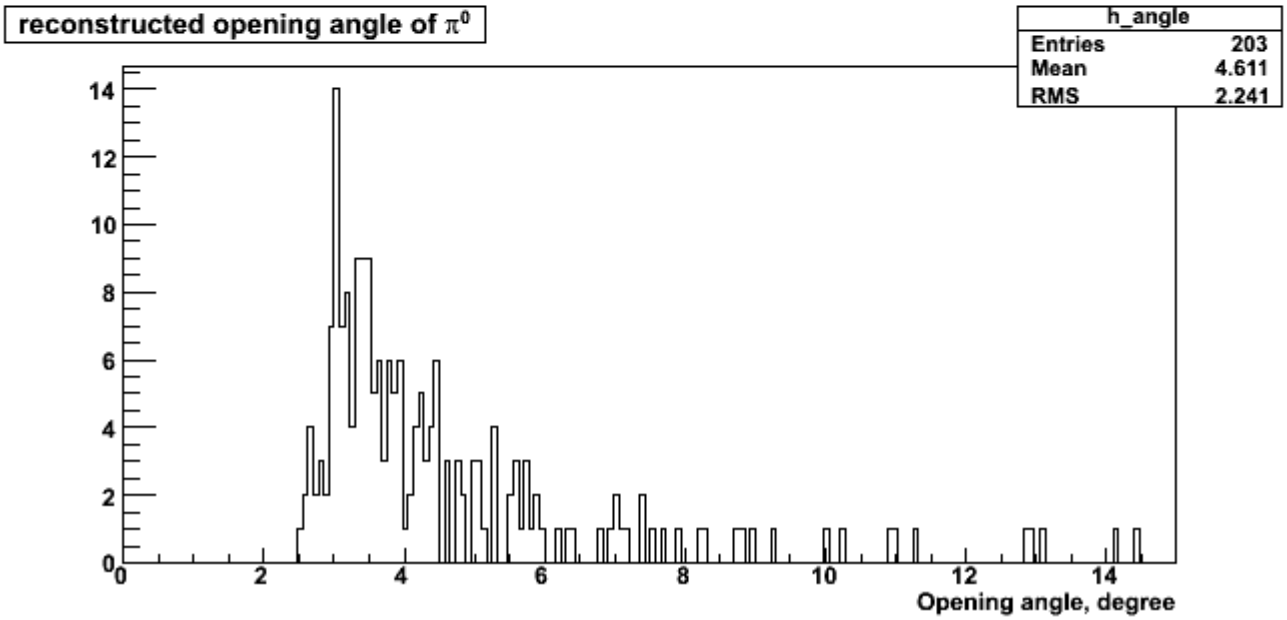
3) pi0_angle_cluster.png, downloaded 1970 times



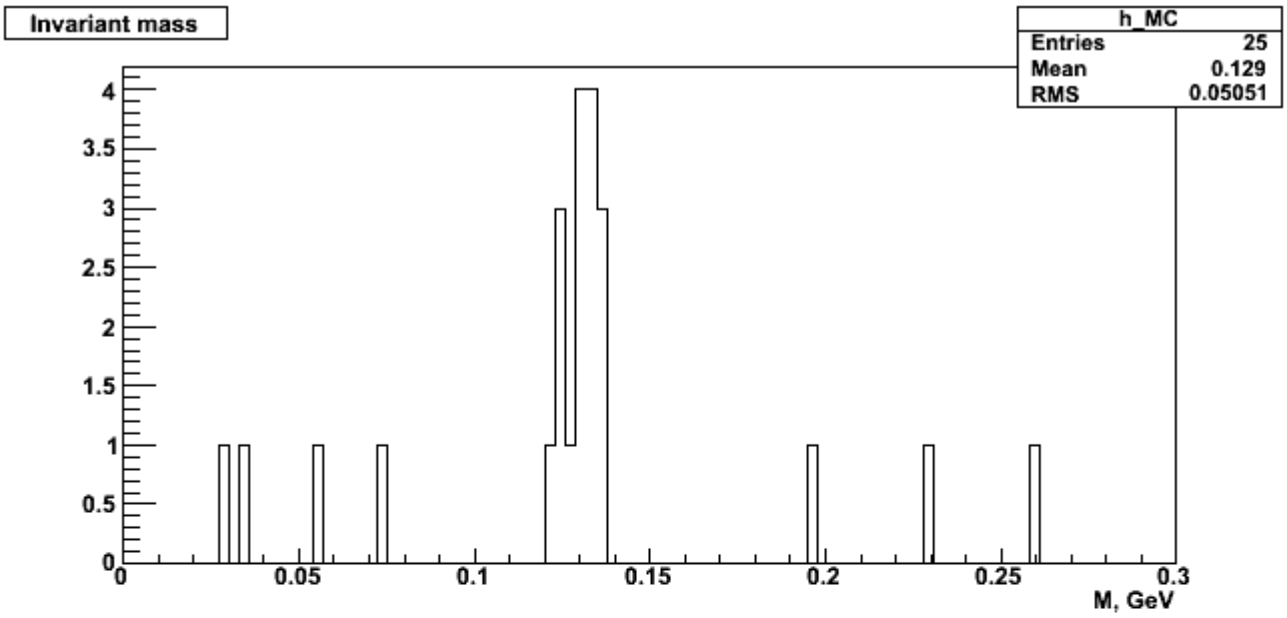


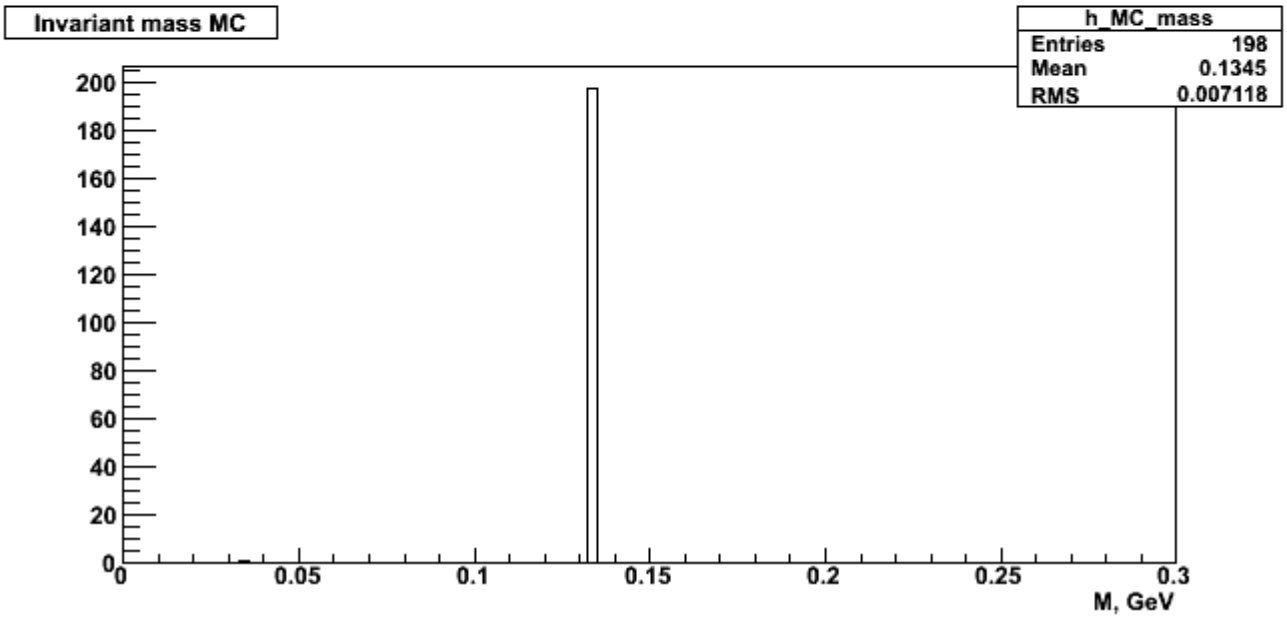
4) pi0_angle_bump.png, downloaded 1865 times



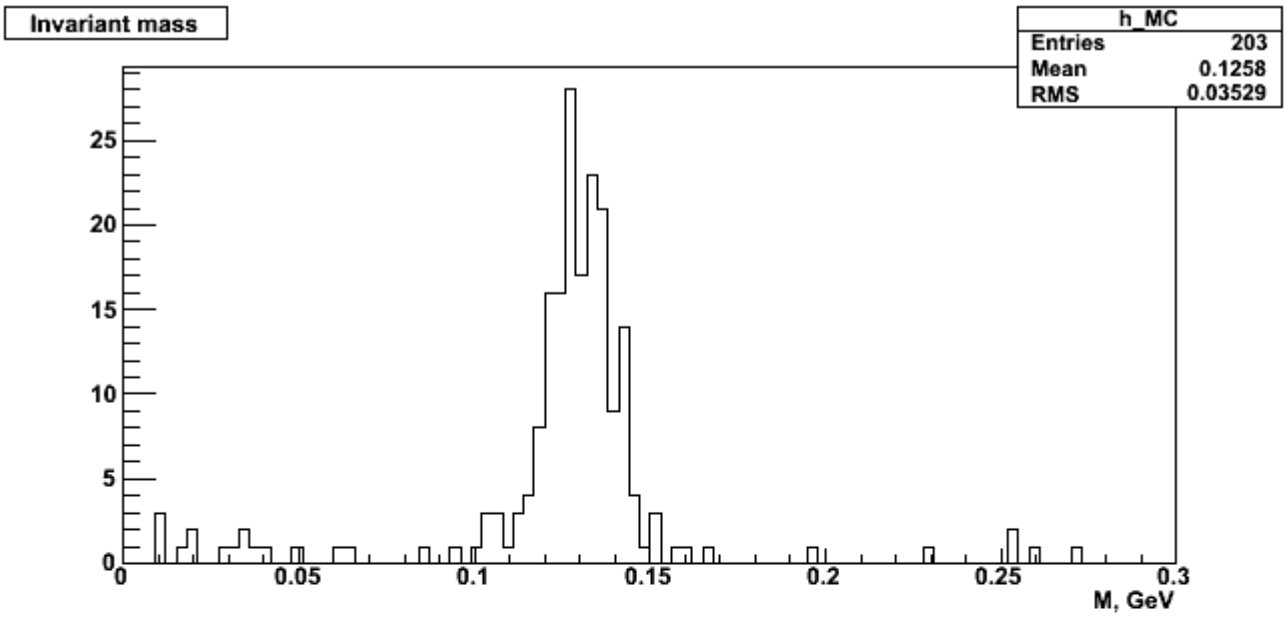


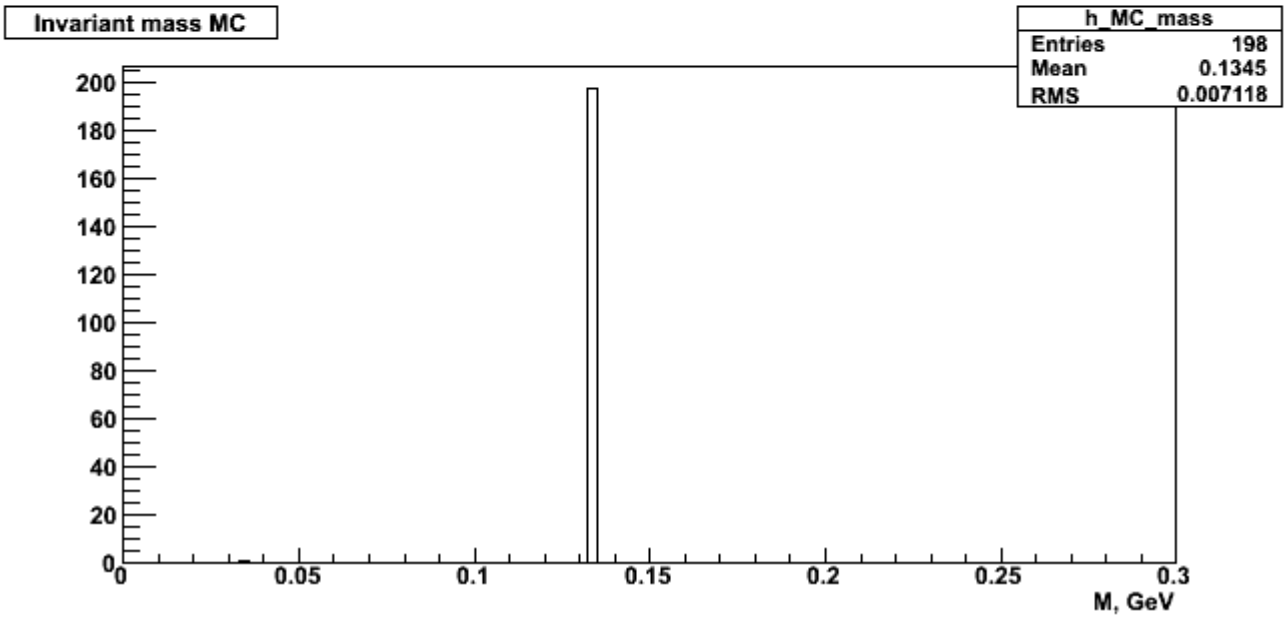
5) m_pi0_cluster.png, downloaded 1941 times





6) m_pi0_bump.png, downloaded 1927 times


Invariant mass
h_MC
Entries 203
Mean 0.1258
RMS 0.03529
25
20
15
10
5
0
0
0.05
0.1
0.15
0.2
0.25
0.3
M, GeV


Invariant mass MC
h_MC_mass
Entries 198
Mean 0.1345
RMS 0.007118
200
180
160
140
120
100
80
60
40
20
0
0
0.05
0.1
0.15
0.2
0.25
0.3
M, GeV