

Missing mass for ${}^4\text{He}(e,e'pn)X$

As we already presented we identified intriguing structure in the missing mass distribution of the ${}^4\text{He}(e,e'pn)$ reaction.

The 750 MeV/c missing mass distribution is presented in Fig1:

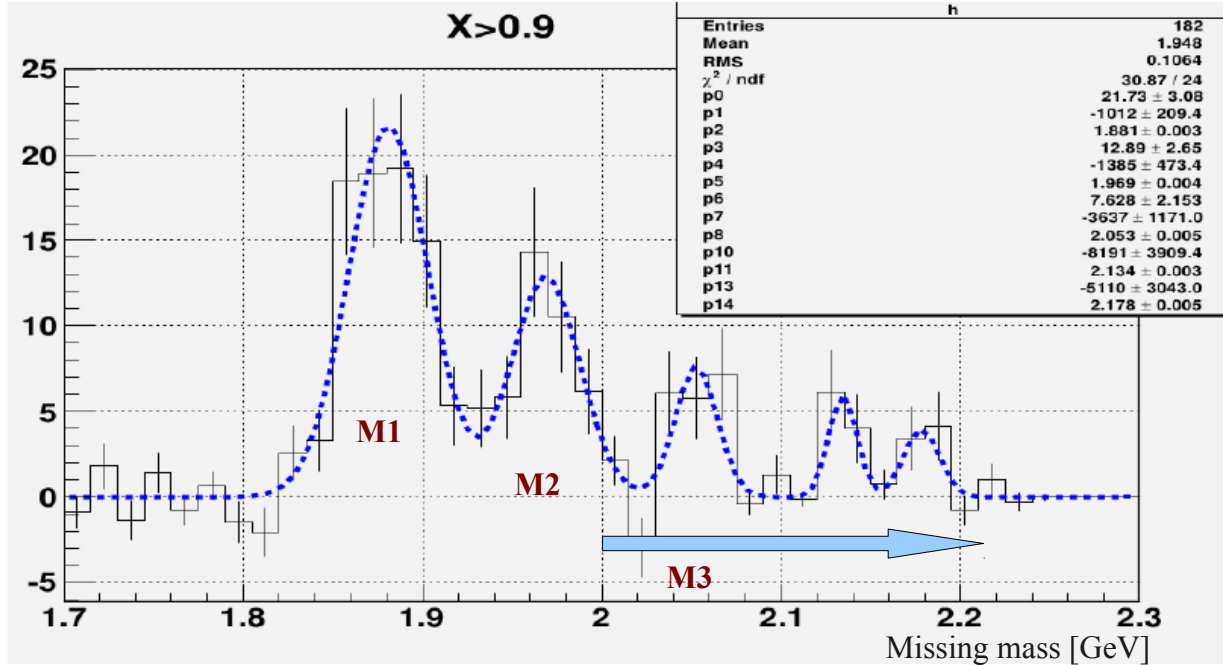


Fig 1

We divided the Missing mass spectrum to three different region, M1, M2 and M3. We looked on the corresponding events using an event viewer software:

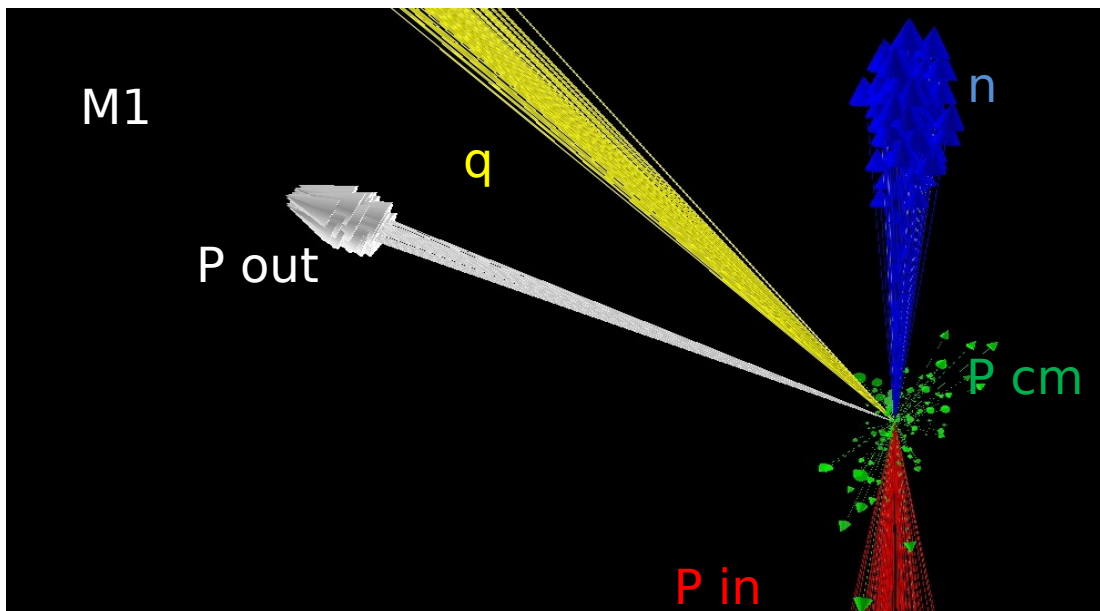


Fig 2

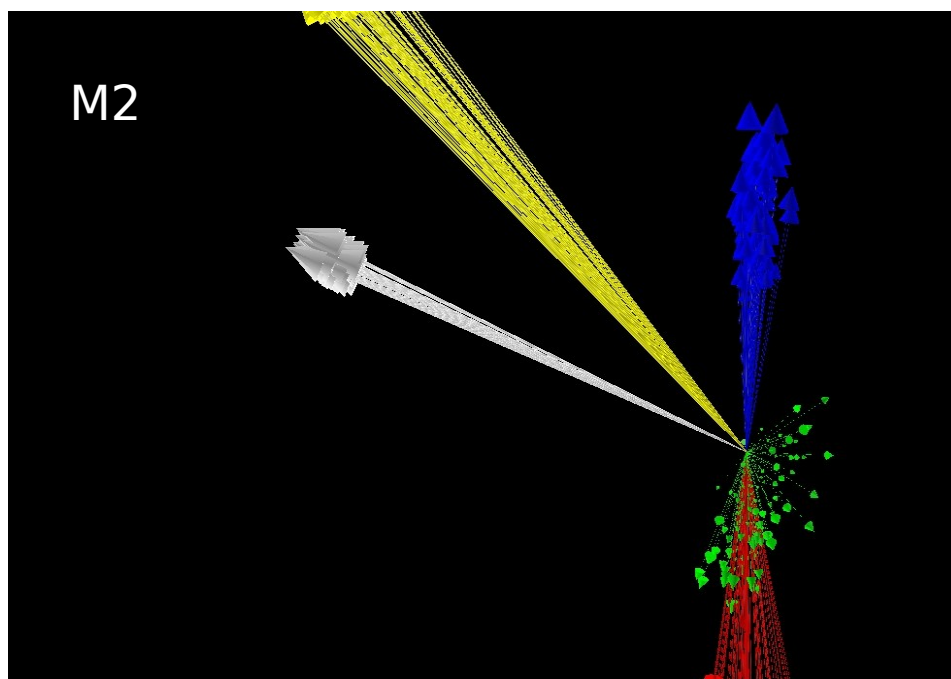


Fig 3

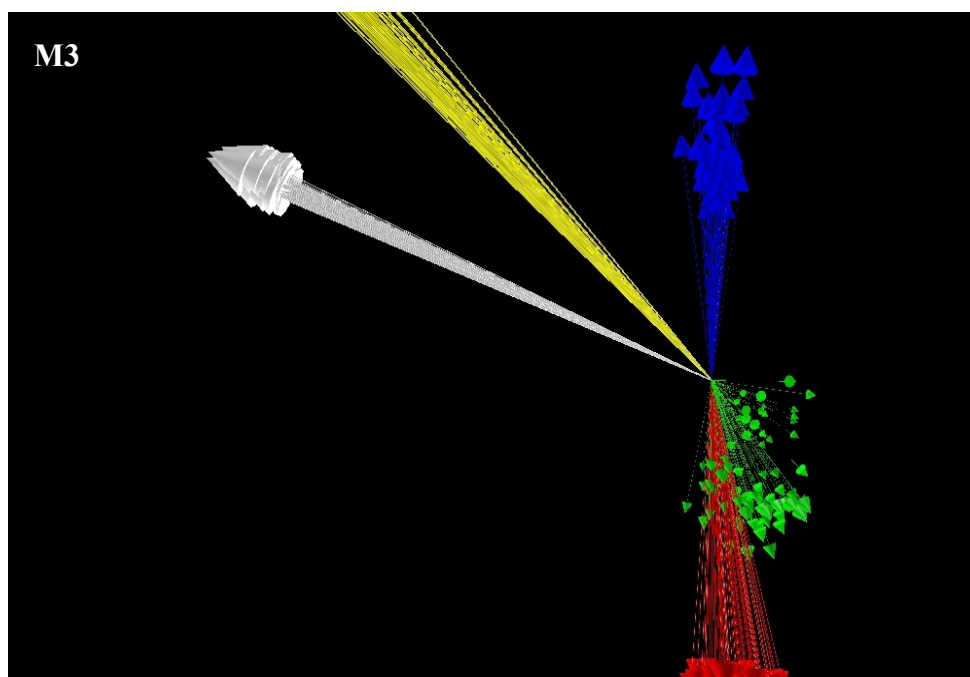


Fig 4

It should be noted that we don't have a way to remove the BG events from these displays.

Mixed events are displayed below:

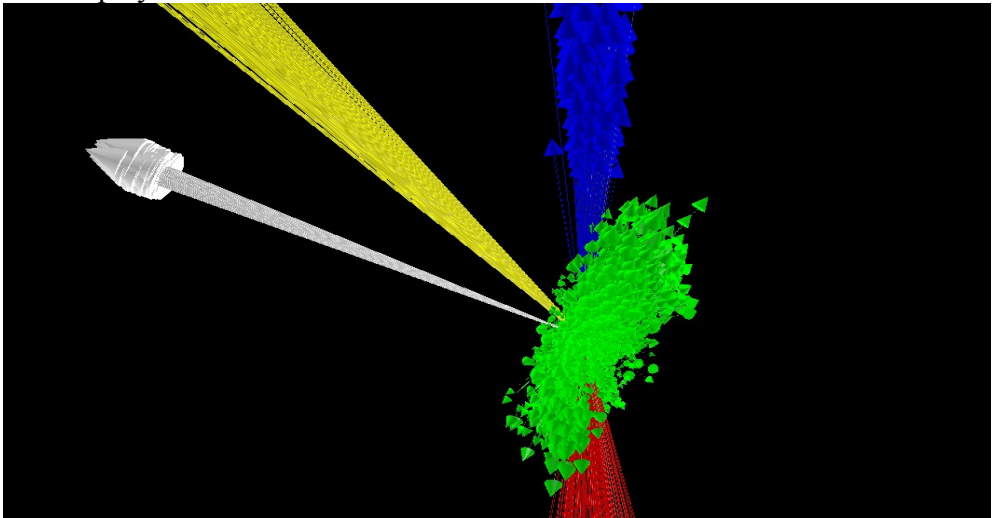


Fig 5: BG distribution with the cut on M1

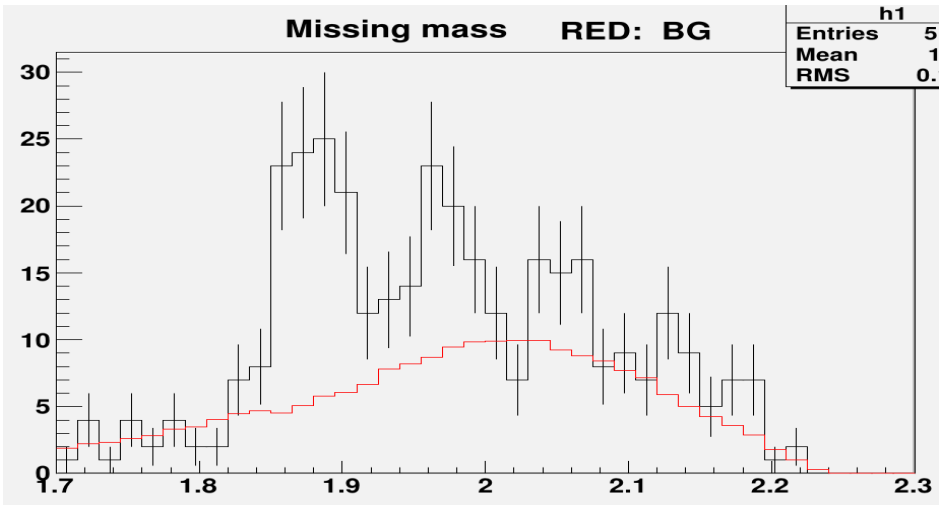


Fig 6: Missing mass with the BG

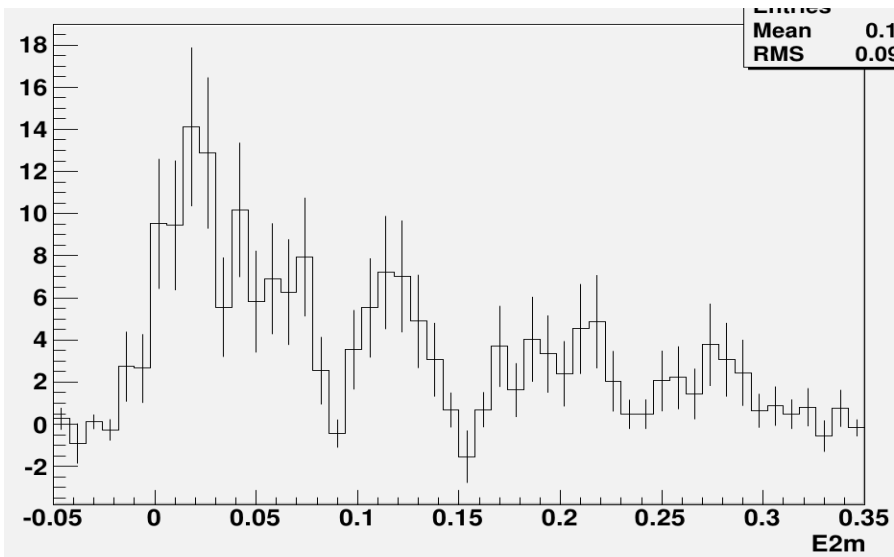


Fig 7: Missing Energy E2m

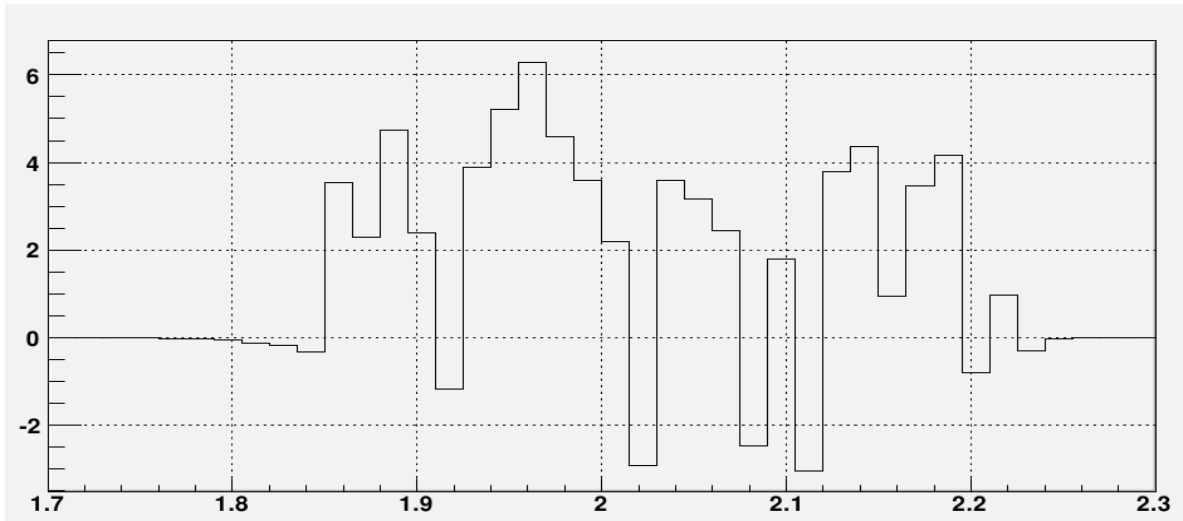


Fig 8: Missing mass with the Cut on opening angle ± 40 deg between P_{cm} and P_{in}

Comments:

- 1) In M2 the c.m. momenta are larger than in M1 and biased toward P_{miss} .
- 2) In M3 the n and P_{miss} are not back to back, P_{cm} larger and toward P_{miss} .
- 3) If we assume three body interaction, i.e. one nucleon of the remained pair took all the energy, and the other is spectator at rest we don't get a consistent result.
- 4) We checked if the origin for the second peak is coming from the target walls. It is not.

500 and 625 MeV/c settings

Similar picture for in the 500 and 625 MeV/c kinematics. However, for the 500 and 625 MeV/c kinematics, we divided the Missing mass spectrum only in to two regions. The main peak M1 and the rest M2 (missing mass bigger than 1.9).

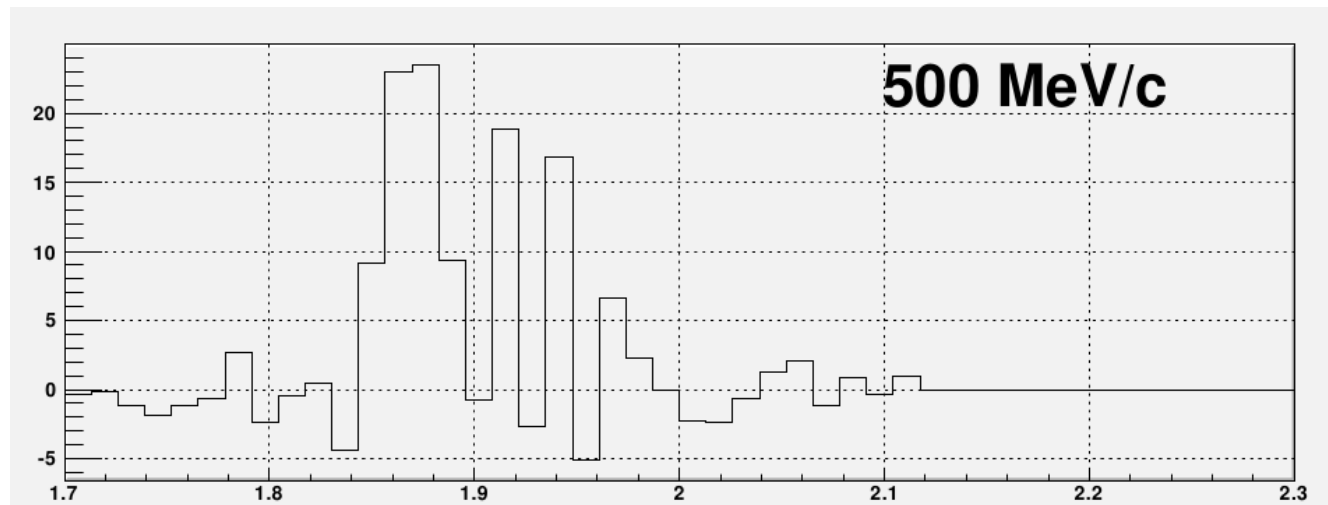


Fig 9

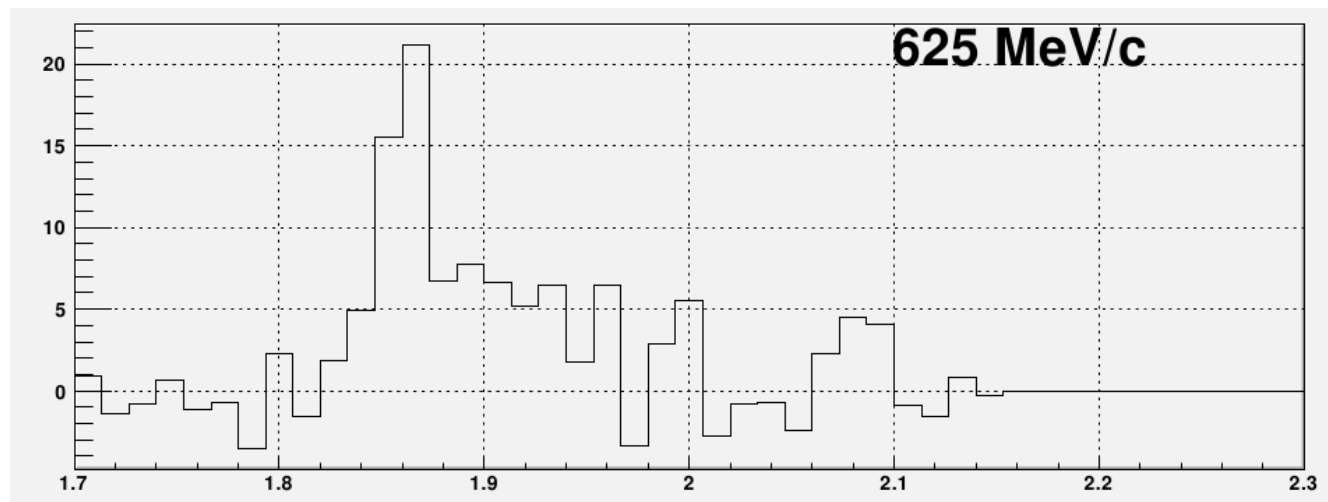


Fig 10

In the following figures we present the events:

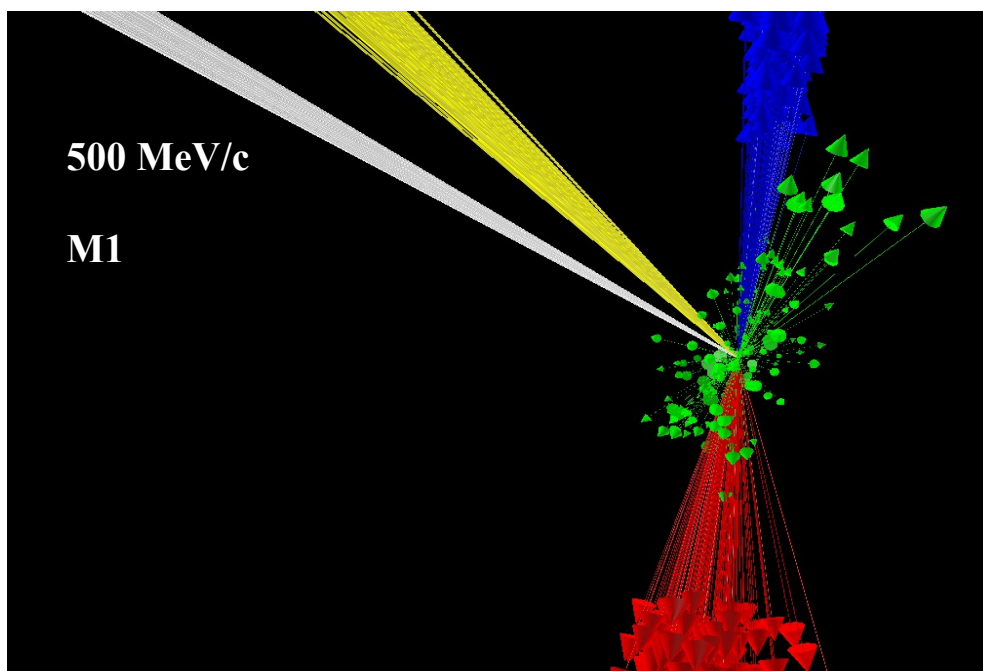


Fig 11

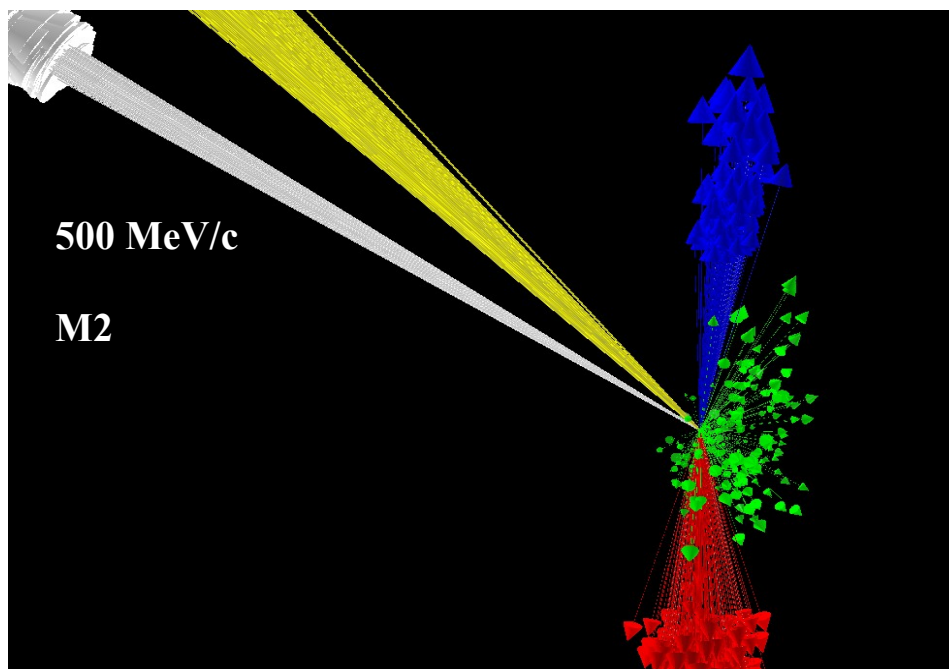


Fig 12

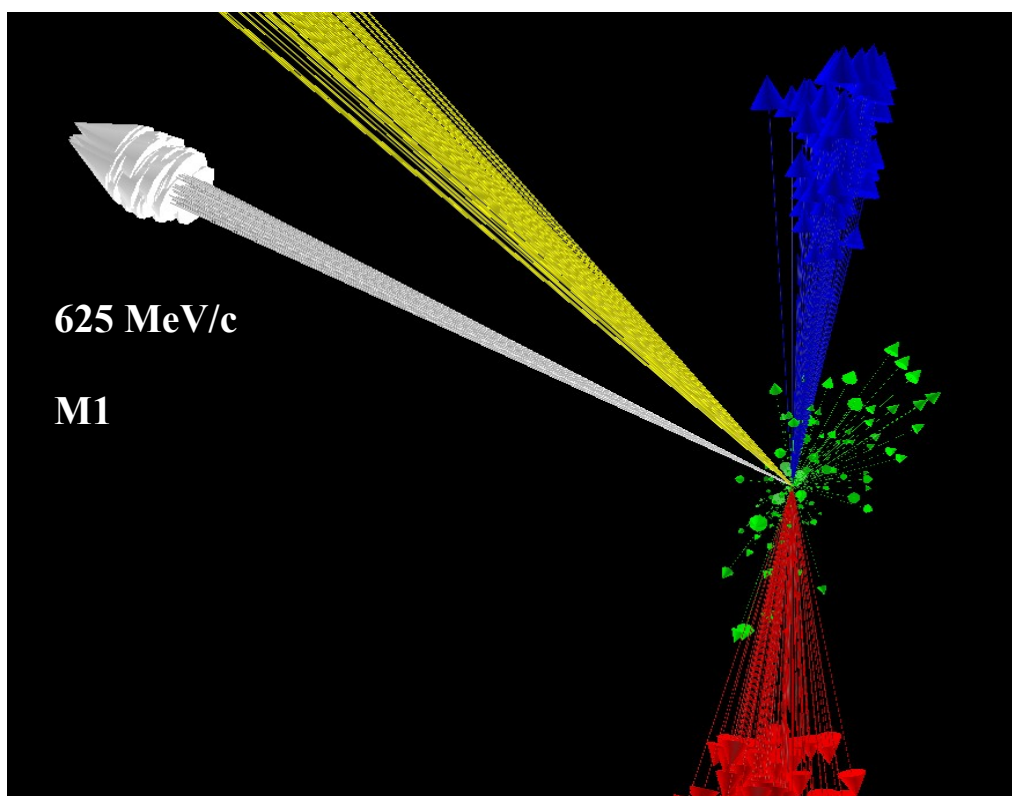


Fig 13

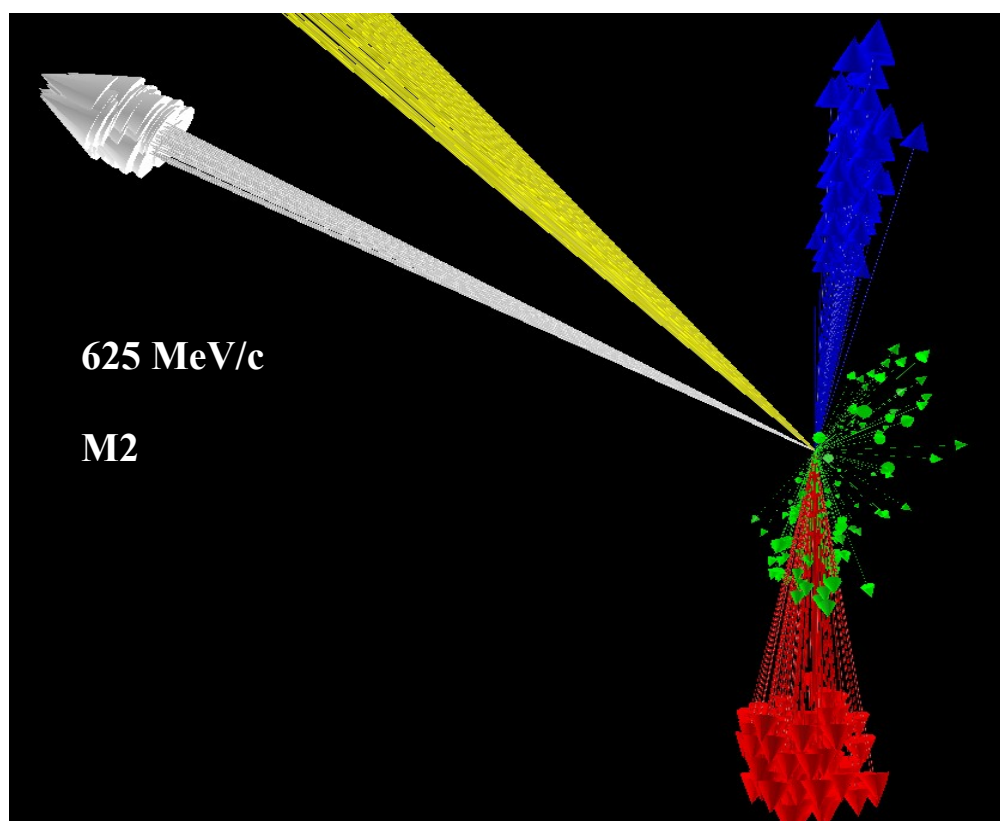


Fig 14

It should be stressed that in the 500 MeV/c and 625 MeV/c case we have higher BG level than at 750 MeV/c.

Missing mass distribution with a cut ± 40 on the opening angle between P_{miss} and P_{cm} :

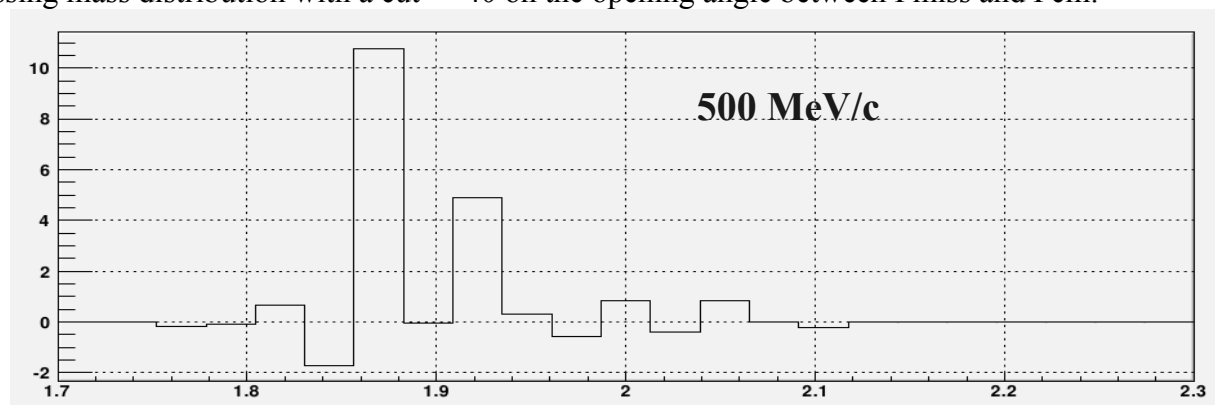


Fig 15

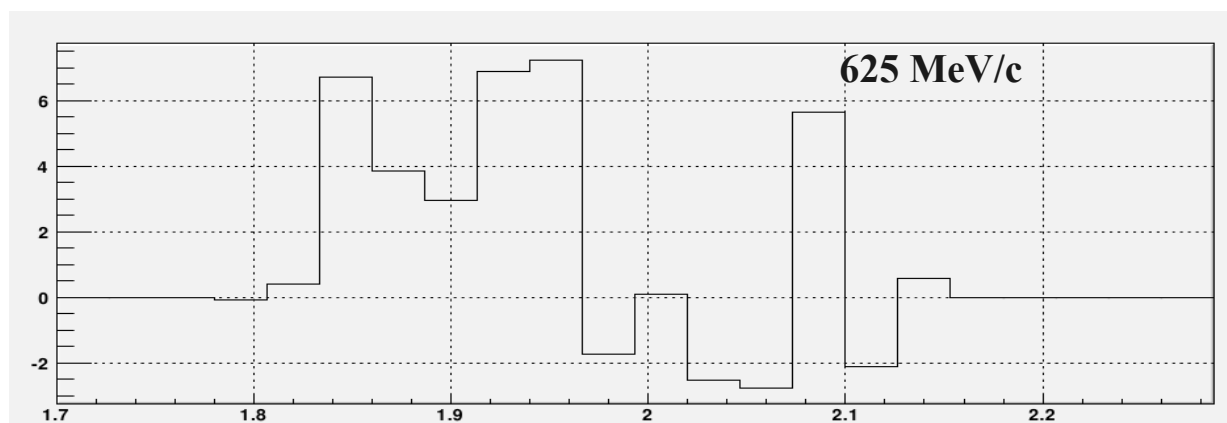


Fig 16