New Measurement of the Direct Decay from the $^{12}$C Hoyle State


April 11th, 2018

1) Is the energy of a $^{12}$C Hoyle state equal to the sum of 3 ground state alpha particles? (Joey)

2) How does the Hoyle state fix the problem with carbon production in the universe? (Taya)

3) What is $^{8}$Be ground state ghost anomaly? (Mamun)

4) What is a Dalitz plot? How is it constructed? What is a symmetric Dalitz plot? (Tyler)

5) How is equation 1 found, and how can it be related to the Dalitz plot with mass squared distribution? (Som)

6) How is the sequential decay said to be dominant from the points in fig. 3? (Sudhanva)

7) Why are there two layers of the silicon detectors to measure the scattered $^{4}$He? (Kristyn)

8) In the experimental setup, why don’t all the detectors measure both energy and spatial scattering (including particle identification)? (Doug)

9) Instead of an alpha Beam, could a different beam, such as a proton beam, be used? Why did they use an alpha beam? (Shiv)

10) What does the beam current unit enA mean? How is it different from nanoamps? (Utsav)

11) How did they separate all the background from the 3 alpha signal? (Abinash)

12) How was the upper limit of the direct decay affected by experimental resolution? (Bishnu)

13) How is the sequential and direct decay simulated in Monte Carlo? (Matt)