Nuclear Lunch Seminar questions on Pentaquarks for Sept. 23 2015

1. What is an invariant mass? Why is it important? (Douglas)

2. What is a Dalitz plot? What are its uses? All Dalitz plots look similar in shape. How can we infer about the shape of a Dalitz plot? How are pentaquark states represented in the Dalitz plot of Figure 5? (Nick)

3. What information do we get from an Argand plot? Why is the Argand plot circular? (Taya)

4. What does it mean to say that a particular result has, say, $5\sigma$ significance? (Abinash)

5. Why do they use $J/\psi \to \mu^+ \mu^-$ as the trigger? (Som)

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7. Why is it that the two pentaquark states have the opposite parities? (Andrea)

8. The $Z(4430)^+$ and the two $P_c^+$ pentaquark states are all charmonium states. Why do charmonium states have such distinct signatures compared to bottomonium, · · ·, etc? (Rekam)

9. Could there be another way to explain the data other than with pentaquarks? (Sudhanva)

10. Why are systems with more quark contents than three not common? (Linda)

11. What is helicity formalism? (Brian)

12. For event reconstruction process, the paper mentions a need of simulation. What information goes into the simulation process? (Nadyah)

13. What is the gradient boosted decision tree (BDTG)? How does it separate signal from background? (Tyler)