Observation of five new narrow $\Omega_c^0$ states decaying into $\Xi_c^+ K^-$

The LHCb collaboration

February 7, 2018

1. Why is the understanding of the resonant states of $\Omega_c^0$ important? (Mamun)

2. What is large-flight distance significance? How is the detector build to achieve and measure such a small distance? In order words, how is the detector able to resolve primary and secondary vertex for the experiment? (Tyler)

3. Why are the two Gaussian functions used to describe the signal? Why use two Gaussian functions, rather than one (or some other function)? (Som)

4. What are the differences in the various decay modes of the seven mass states of $\Omega_c^0$ that are predicted from the Heavy Quark Effective Theory (HQET)? What decay modes are mentioned in the paper? (Sudhanva)

5. How are particles, like $\pi^-$ and $K^-$, identified? (Taya)

6. The paper says no narrow peaks observed in the pseudo-$\Xi_c^+ \pi^-$ spectrum. How is this done? Why are there no peaks? (Avinash)

7. How does the paper justify the $\Omega_c(3188)^0$? Does it correspond to the theoretical prediction of other $\Omega_c^0$ mass states? (Bishnu)

8. How can the spin-parity of the mass states match up by the experiment in response to theory? (Doug)

9. Highlight the difference in the mass states of $\Omega_c^0$ from the theoretical predictions (HQET). Why are the peaks of the masses wide or narrow? (Matt)

10. How is the cut-based preselection and the multivariate selection done for the reconstruction process? (Kristen)

11. What is inclusive $\Xi_c^+$ sample? How does inclusive process affect the results? (Shiv)

12. How are the predictions of the mass states for $\Omega_c^0$ from the Heavy Quark Effective Theory (HQEFT) different from the Lattice QCD calulations? (Mahesh)

13. Why is the background fit linearly in one plot and exponentially in the other? (Cole)

14. What is the importance of Feed-down in the experiment? How is it taken into account for the description of the data? (Joey)

15. What are Blatt-Weisskopf factors? How does one vary Breit-Wigner functions with these factors? (Robert)