

## Question for INPP lunch discussion (Sept. 26, 2012) on the Higgs boson paper:

1. What does the experimental significance 5-sigma mean? How is this different from the expected (standard-model prediction) significance of 5.8-sigma? (**Harsha**)
2. What is a local p-value in Fig. 2? Can you explain the three curves? (**Alina**)
3. Is there a theoretical prediction for the mass of the Higgs boson? How about for other particle masses (quarks, leptons, etc.)? (**Bijaya**)
4. Can there be more than one Higgs boson? What does theory tell us about how many types of Higgs boson are possible? Which one was observed? (**Cody**)
5. Why doesn't "Higgs boson" appear in the title of this paper? How do you explain Fig. 19? (**Andrea**)
6. If the Higgs boson has no charge, then how can it couple to photons? What diagram causes a small branching ratio to 2 photons? (**Azumat**)
7. What is meant by  $t$  and  $t$ -bar in the decay diagrams? What is the meaning of bottom-antibottom as a branching ratio for the Higgs? (**Anthony**)
8. What is the experimental setup? How do they detect signal events? Do they detect W or Z particles directly in the detector? What about 2-gamma events? (**Bing**)
9. What is the significance of the Goldstone theorem? Why aren't people searching for the Goldstone boson? (**Brian**)
10. What do you mean by longitudinal polarization of a massive gauge boson? How does this relate to the Higgs boson? (**Linda**)