Questions from the discussion of “Anti-Hydrogen trapping at CERN”

1. How do you produce anti-protons for the experiment? How were the anti-protons and positrons slowed down in the experiment? (Anthony Paul)

2. How stable is anti-hydrogen? Shouldn’t it be as stable as hydrogen? Is there any hydrogen in the trap? If so, don’t they annihilate? (Sushil)

3. What is the average lifetime of anti-hydrogen in the trap? (Dilu)

4. What do you mean by “cold” hydrogen? Why is it crucial to keep the anti-hydrogen atoms cold? Can it be formed only at 0.4 K temperatures? What is evaporative cooling? (Ken Moore)

5. Why do they assume the weak equivalence principle? Why would matter and anti-matter obey different gravitational laws but not difference in other laws? (Daniel Sayre)

6. What is a Rydberg state? At what point is a Rydberg state considered “high”? Does a high Rydberg state decay faster or slower than a low Rydberg state? Why? (Young Shin)

7. Why does the 2s state have a long lifetime? How does it decay? (Harsha)

8. How does 2 photon absorption work? Is it limited only to back-to-back photons? How does it eliminate first-order Doppler broadening? (Martin)

9. The Hamiltonian has a L.S term. How much are the orbital and spin states split? What is meant by “microwave spectroscopy of hyperfine splitting”? (Shamim)