

# Laser Spectroscopy of Muonic Deuterium

November 16, 2016

1. How are the Lamb shifts used to measure the radius of the nucleus? Why were  $K_\alpha$  x-rays detected rather than  $K_\beta$ ,  $L_\alpha$ , or others? (**Mamun**)
2. Why does the nuclear quadrupole moment affect the ordering of the  $2P_{3/2}$  sublevels (see Figure 1)? (**Sudhanva**)
3. How does the proton radius relate to the Rydberg constant? Are there alternate values for the Rydberg constant? (**Matt**)
4. Why is the data fit with a Lorentzian? How do they estimate the background level at 2 in Figure 2? (**Taya**)
5. Why was the pulsed laser system calibrated against water vapor absorption lines? (**Abinash**)
6. What does dispersion mean in Figure 4? How are the CODATA results obtained? (**Andrea**)
7. What is the lowest  $q^2$  used in the extrapolation in e-p scattering from JLAB? (**Gula**)
8. What do we mean by the term e- $\mu$  universality? How is it related to the proton/deuteron radius puzzle? (**Tyler**)
9. Are there other experiments to measure this ( $r_p$  or  $r_d$ )? If so, what are they? (**Kristyn**)
10. What are some possible beyond standard model solutions to the proton radius puzzle? (**Shiv**)