Nuclear Lunch Questions (2021 g – 2)

1. Give a brief explanation of the origins of the leading order Hadronic vacuum polarization contribution in the first figure. **(Alexandra)**
2. Give a brief explanation of the origins of the leading order hadronic light-by-light contributions in the first figure. **(Joseph Derkin)**
3. How exact is the cancellation of the 2nd term in Equation 1 and which if any correction terms/factors in Equation 4 account for any non-cancellation? **(Yenuel)**
4. How exact is the cancellation of the 3rd term in Equation 1 and which if any correction terms/factors in Equation 4 account for any non-cancellation? **(Shyam)**
5. How does the collaboration plan to reduce systematic uncertainties in future runs of this experiment? **(Joey Rowley)**
6. Explain the Relative Muon Intensity Plot **(Jacob)**
7. When referring to "5\sigma," is the \sigma uncertainty from theory, experiment, or both? If both, how does \sigma incorporate both? **(Bradley McClung)**
8. Because this is a precision experiment, don't the atmospheric muons infiltrate the storage ring? If yes, how do the experiment and calculation account for the corrections due to atmospheric muons. If not, why would not thy matter? As part of the answer, estimate the rate of horizontal cosmic ray muons of energy within the beam energy window and location as well as the decay probability for other relativistic cosmic ray muons passing near the detectors-- **(Mahesh)**