

Nuclear Lunch Questions

Paper: Accurate Determination of the Neutron Skin Thickness of ^{208}Pb through Parity-Violation in Electron Scattering (PREX Collaboration)

Discussion: November 10, 2021

1. How does one go from the parity-violating asymmetry, A_{PV} , to the quantity $R_n - R_p$? (**Ibrahim**)
2. What is the weak radius and why is it important in this paper? (**Shyam**)
3. How does one determine A_{corr} in the equation to obtain A_{meas} (Eq. (2))? (**Justin W**)
4. What does the theory uncertainty in Fig. 3 mean? How is it determined? Is this the only possible theory uncertainty? (**Joey**)
5. What is the dipole polarizability Gula mentioned in her talk? Is that number from a measurement? How is it relevant to the issue of neutron skin thickness/nuclear matter symmetry energy slope (the L parameter)? (**Mahesh**)
6. Is it a problem that PREX-2 predicts an interior weak density less than zero (in the paper, $\rho_W^0 = -0.0798 \pm 0.0038$ (exp) ± 0.0013 (theo) fm^{-3})? How is this negative value obtained (where does this value originate from)? (**Yenuel**)
7. What is a septum (used in the experimental setup)? What are the experimental limitations for forward scattering here? (**Justin B**)
8. How does this measurement of the neutron skin thickness in Pb relate to the properties of neutron stars? Other than neutron stars, why else does this PREX-2 result matter? (**Robert**)
9. Can we use any other element instead of Pb to measure the neutron thickness? If yes, which are these? If no, why only lead? (**Joseph D**)
10. Is it worth the effort to measure the skin more precisely? (**Nisha**)