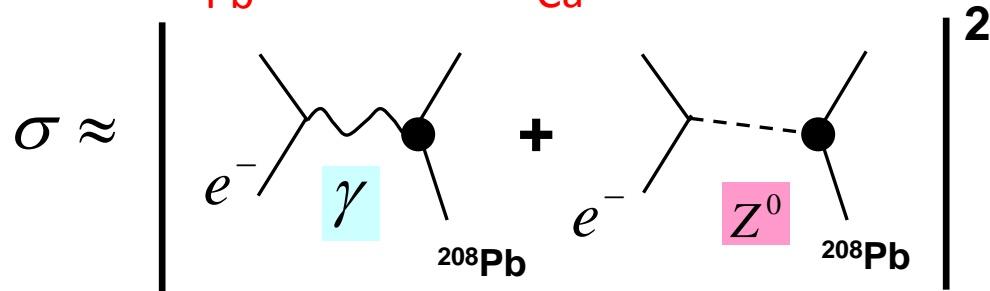


PREX and CREX

^{208}Pb

^{48}Ca



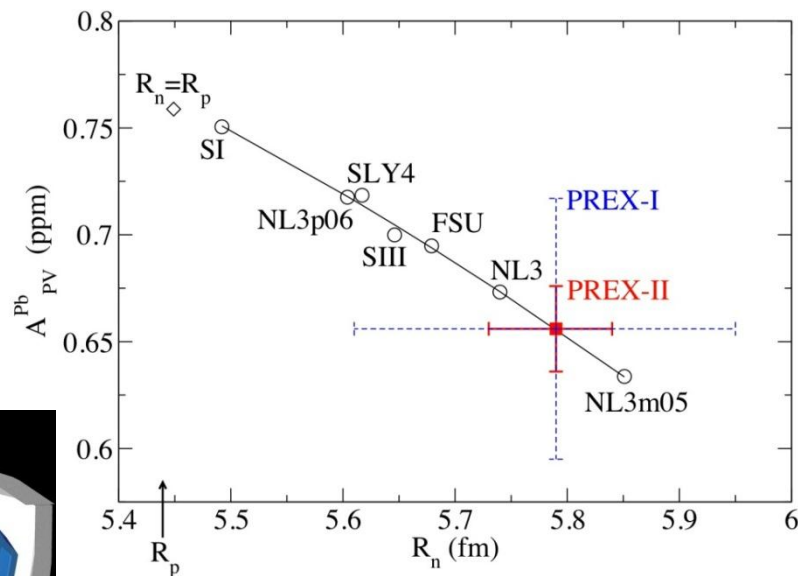
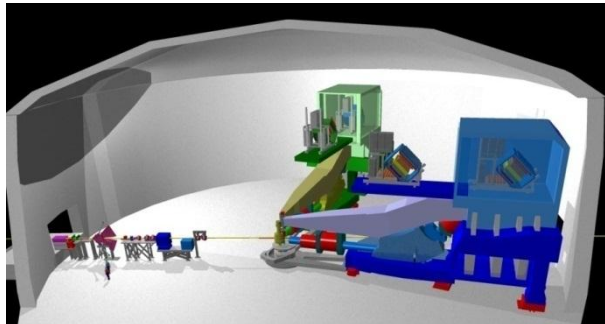
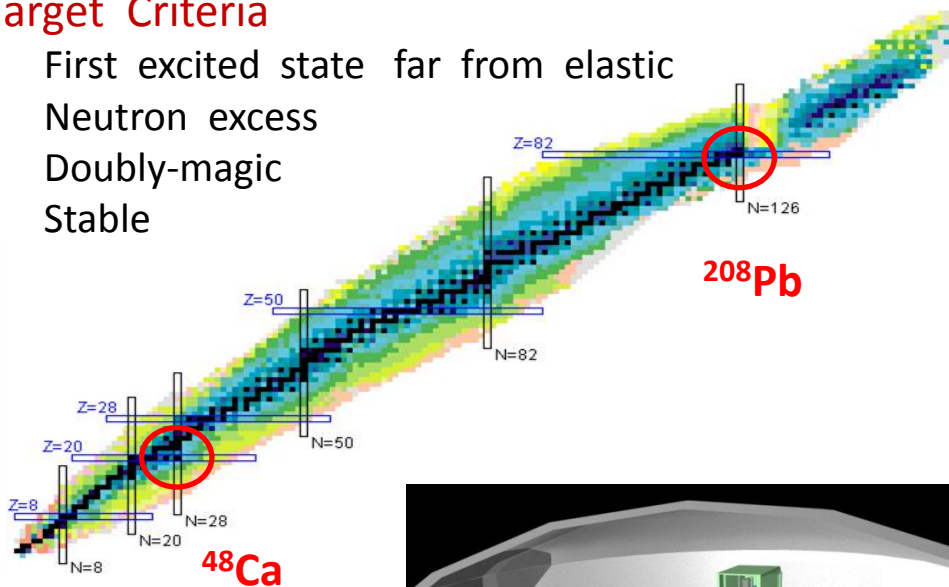
$$A_{PV} = \frac{\sigma_R - \sigma_L}{\sigma_R + \sigma_L} \sim \frac{G_F Q^2}{4\pi\alpha\sqrt{2}} \frac{F_W(Q^2)}{F_{chg}(Q^2)} \sim 1 \text{ ppm}$$

Electroweak Asymmetry in Elastic Electron-Nucleus Scattering

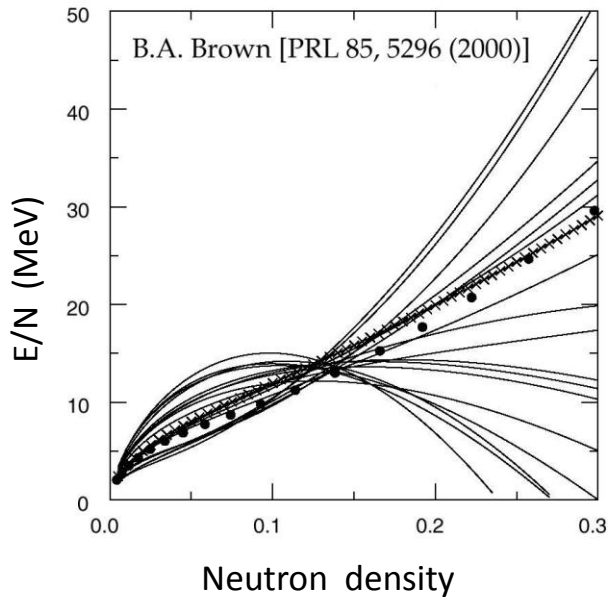
- Weak charge form factor
- most weak charge is carried by **neutrons**

Target Criteria

- First excited state far from elastic
- Neutron excess
- Doubly-magic
- Stable

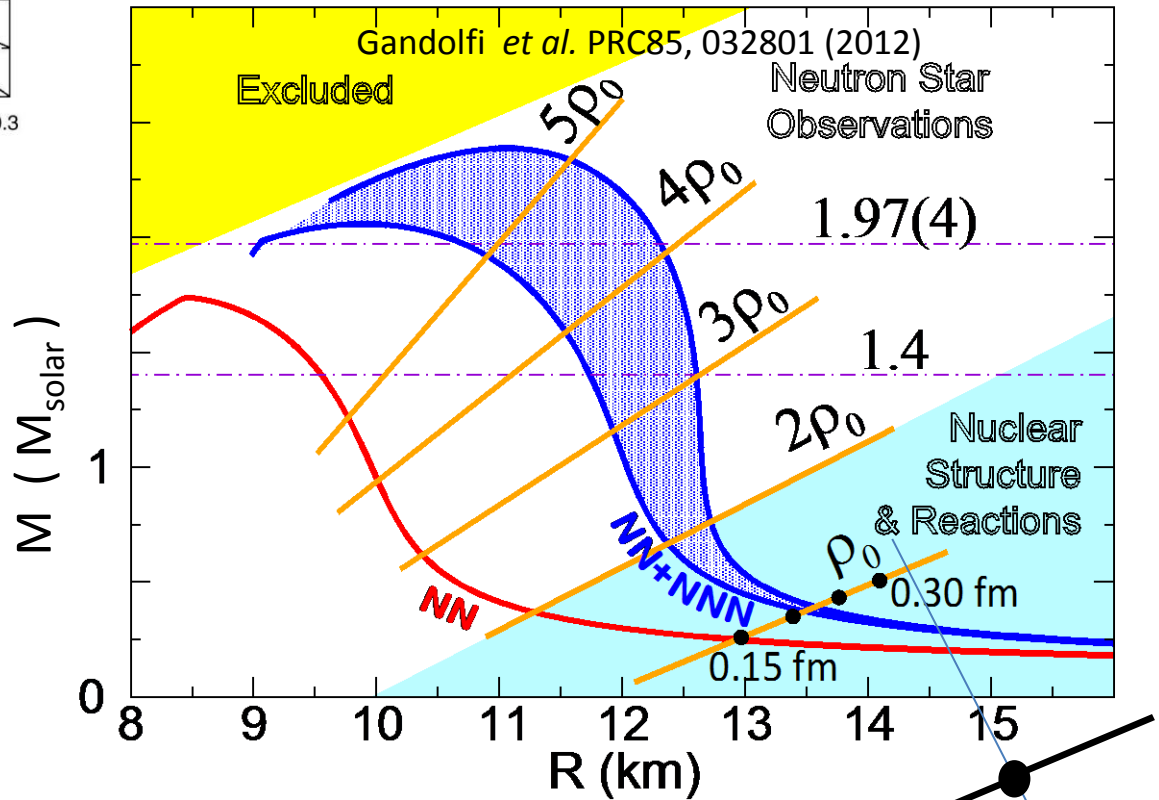


High Resolution Spectrometers in Hall A at



Using models, one can relate the neutron star radius to the neutron skin of heavy nuclei

Neutron EOS. How to extrapolate to higher densities like Heavy Ion Collisions or Neutron Stars ?

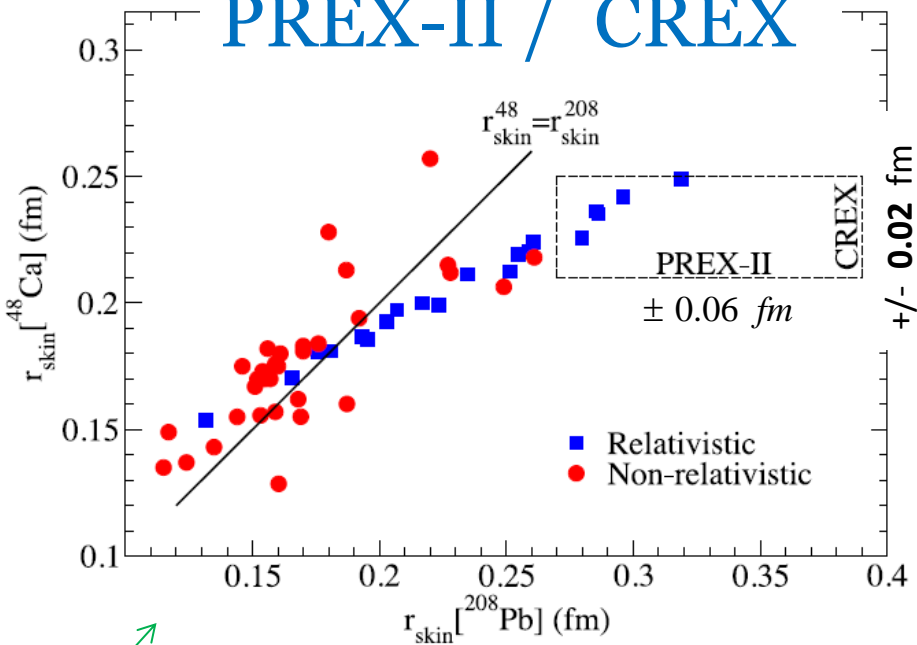


PREX I

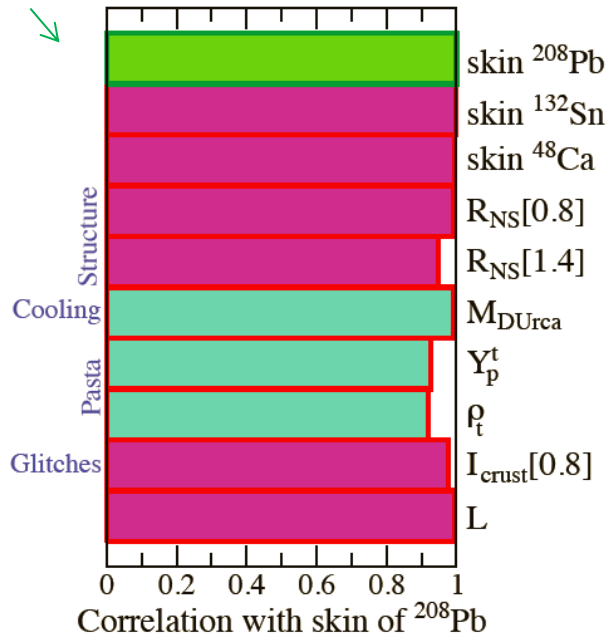
$$R_n - R_p = 0.33^{+16}_{-18} \text{ fm}$$

PREX II

PREX-II / CREX



J. Piekarewicz, arXiv 1305.7101



- **PREX-II** and **CREX** are approved to run at JLab
 - PREX A rating 35 days in ~2016
 - CREX A- rating 45 days date uncertain
- Systematic Error Goals for PREX-II demonstrated by PREX-I.
- **PAC 2014:** PREX is among the “high impact” experiments at JLab. but CREX not
- **Needs?** These fit into the Jlab budget spread over a few years. We already procured ^{208}Pb and septum repairs.
 - PREX-II needs shielding, vacuum chamber, diamond foils, collimators.
 - CREX needs ^{48}Ca (loaned), target vessel, proposed to use PREX septum.