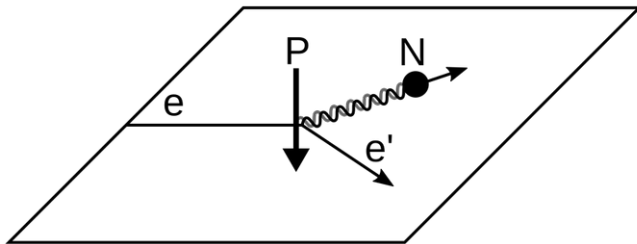
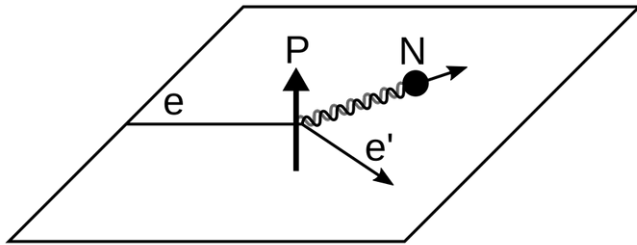


Beam-Normal Single-Spin Asymmetry

- Interference term amongst one- and multi-photon exchange
 - Important background in parity violation experiments
 - Experimental observation:
 - Elastic electron scattering
 - Polarisation perpendicular to scattering plane
 - Unpolarised target
- => Count-rate asymmetry amongst polarisation states



Dr. Anselm Esser
for the A1 Collaboration

Agreement with Theoretical Calculations

Good / acceptable agreement for:

^1H ✓

^4He ✓

^{12}C ✓

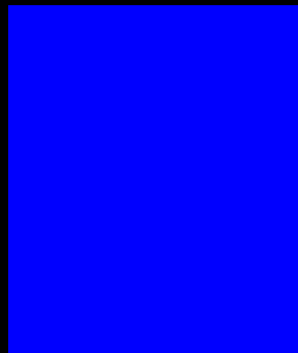
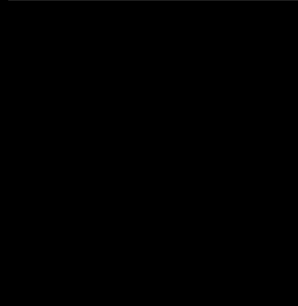
^{27}Al

^{28}Si

^{40}Ca

^{48}Ca

^{90}Zr



Agreement with Theoretical Calculations

Good / acceptable agreement for:

^1H ✓

^4He ✓

^{12}C ✓

^{27}Al

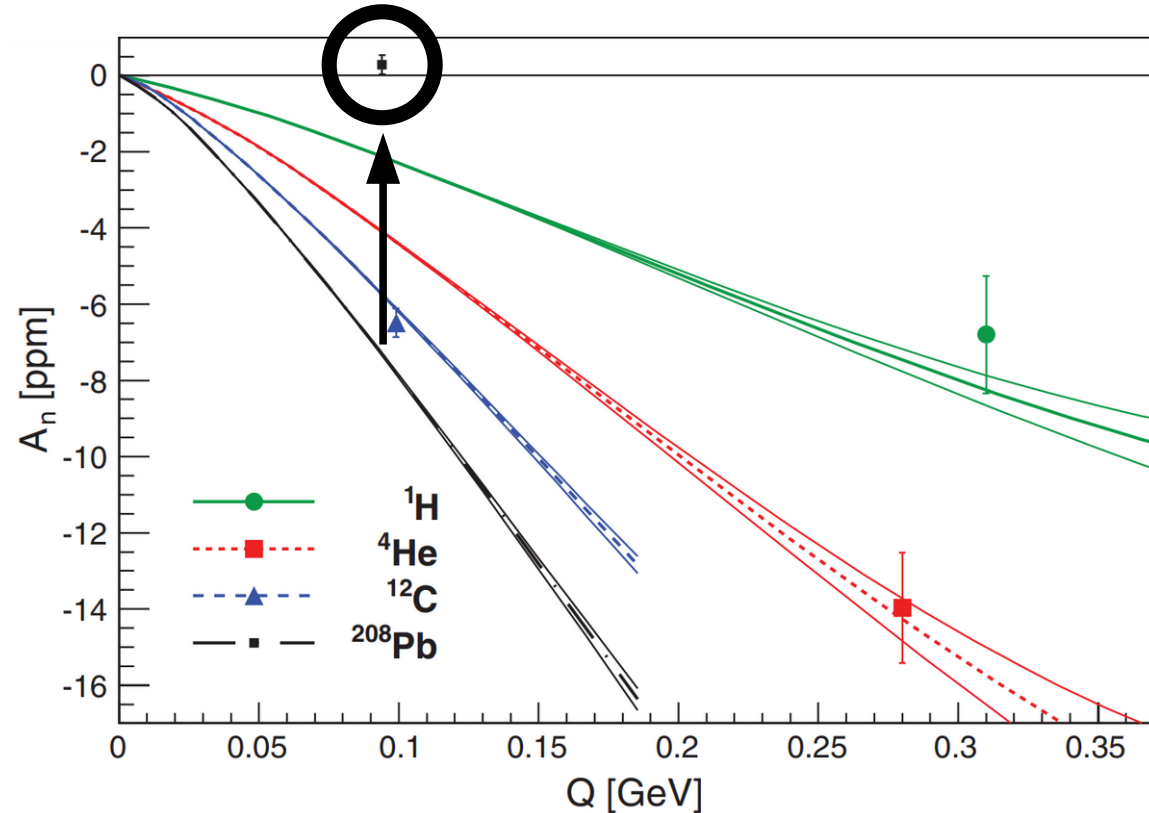
^{28}Si

^{40}Ca

^{48}Ca

^{90}Zr

Where the problem started ...



Agreement with Theoretical Calculations

Good / acceptable agreement for:

^1H ✓

^4He ✓

^{12}C ✓

^{27}Al ✓

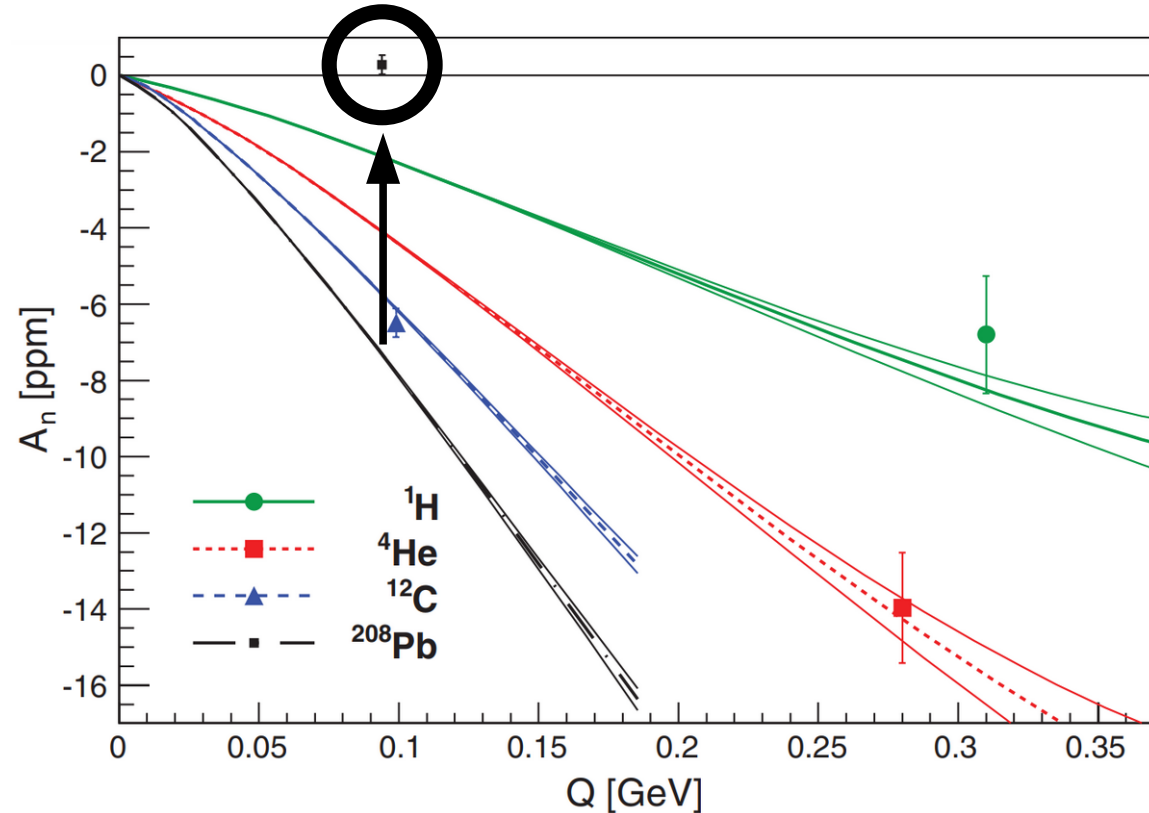
^{28}Si ✓

^{40}Ca ✓

^{48}Ca ✓

^{90}Zr ✓

Where the problem started ...



New Measurement in Mainz

Measurement of the Beam-Normal Single-Spin Asymmetry on ^{208}Pb

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Beam-Normal Single-Spin Asymmetry



Theoretical description:

- Interference term amongst one- and multi-photon exchange
- Important input for effective field theories

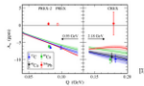
Experimental importance:

- Background in parity violation experiments

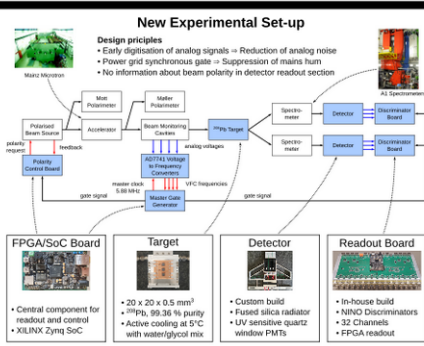
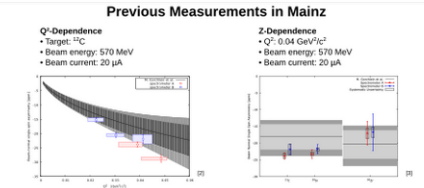
Measurement:

- Elastic scattering of polarised electrons on unpolarised targets
- Polarisation vector perpendicular to scattering plane

State of Knowledge



- Acceptable agreement between existing theories and experiments for light nuclei
- Significant discrepancy for ^{208}Pb



New Result

