**Ab initio short-range-correlation scaling factors in nuclei up to A=40**

**Objectives**
- We use quantum Monte Carlo methods to calculate the short-range-correlation scaling factor $a_2$ in nuclei up to $^{40}$Ca as ratio of two-nucleon coordinate-space densities in the limit of short interparticle distance.
- We employ both phenomenological potentials and local chiral interactions up to next-to-next-to-leading ($N^2$LO) order for different values of the cutoff $R_0$.

**Impact**
- The short-range-correlation (SRC) scaling factor for a nucleus A relative to the deuteron $a_2(A/d)$ and relative to $^3$He $a_2(A/^3$He) is calculated from ab initio low-energy nuclear theory in light and medium-mass nuclei, with the first predictions for $^6$He, $^6$Li, $^{16}$O, and $^{40}$Ca.
- Results are largely scheme and scale independent, i.e., they do not depend on the specific nuclear potential, even though the two-nucleon densities from which $a_2$ is extracted are manifestly scheme and scale dependent.
- The quantum Monte Carlo estimates of $a_2$ agree with the available experimental information in the mass range investigated, even for a simplified phenomenological interaction that does not include the tensor force.
- The employed framework further predicts that the EMC effect and SRC scaling factors have minimal or negligible nuclear isovector corrections.
- Using the the empirical linear relationship between the slope of the EMC effect and SRC scaling factors, the slope of the EMC effect is estimated for $^6$He, $^6$Li, $^{16}$O, and $^{40}$Ca.

**Accomplishments**