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Measurement of the alpha-particle Monopole Transition Form Factor at MAMI

Tuesday, 1 August 2023 16:30 (25 minutes)

In this presentation, a new measurement of the monopole transition form factor of the ground state to the first excited state of the alpha-particle will be presented [1]. The precision of the measurement exceeds significantly the precision of existing data sets and allows for the determination of two coefficients in a low energy expansion.

The results are confronted with state-of-the-art theoretical calculations including modern nuclear forces, which nevertheless fail to reproduce the data by a factor of about two.

In the outlook, the few-body program at the MAGIX experiment at the new MESA accelerator will be presented. This experiment will be optimized to measure the low energy excitation of light gas targets with high resolution spectrometers using the high beam current of an energy recovery linac.

[1] Phys. Rev. Lett. 130, 152502 (2023)

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