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New measurement of the EMC effect in light nuclei

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Twenty-six years ago, CERN physicists made the unexpected observation that the quark distribution in a nucleus is not just the sum of the quark distributions of its nucleons. This raised the logical question on the possible modification of nucleon structure in the nuclear medium. Describing the behavior of the nucleon in-medium has been one of the challenges of theoretical nuclear physics. Even after years of study, including additional measurements at CERN, SLAC and HERA, there is not a clear consensus. It has been broadly accepted that nuclear binding and Fermi motion should be included in any realistic models. Yet still some “by-products” of theoretical calculations, i.e. nucleon swelling or pion enhancement, are in contradiction with other experimental results. JLab Hall C experiment E03-103 was designed for a precision measurement of the EMC effect in light nuclei, where reliable calculations can be performed. The experiment collected the first data on the EMC effect in ^3He at large x . It also improved the precision on the EMC ratio of medium to heavy nuclei. Our light nuclei results suggest a local density dependence in which the EMC effect would be sensitive to the detailed structure of the nuclei. In this talk, I will give a short review of the EMC effect with particular emphasis on new insights emerging from the recent JLab results.