

Mesons in the Medium: Experiments with CLAS at Jefferson Lab

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Hadrons are viewed as composite particles consisting of quarks and gluons. Predictions based on fundamental symmetries, like chiral symmetry, suggest that the mass and width of the hadrons will be modified in the nuclear medium from their free-space values [1]. Medium modifications in nuclei can be studied with both short-lived and long-lived hadrons. The short-lived hadrons provide direct access to the mass and width. The in-medium cross sections and collisional widths can be measured by the absorption of long-lived hadrons, as they traverse the nucleus. In Hall B at the Thomas Jefferson National Accelerator Facility (Jefferson Lab), the CLAS detector was used to study a number of mesons in nuclei. The ρ meson, with its short lifetime, was investigated for changes to the mass and width [2,3]. The absorption of the ω , ϕ , and K_s mesons were also measured. All of the mesons were produced by a photon beam with $E_\gamma < 4$ GeV in targets of ^2H , C, Fe, and Pb. The vector mesons were reconstructed through their decay into e^+e^- , in order to eliminate final state interactions. The K_s mesons were measured with their dominant $\pi^+\pi^-$ decay. An overview of the experimental program will be given.

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[3] M.H. Wood *et al.*, Phys. Rev. C **78**, 015201 (2008).

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