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Determination of the ω- and η'-Nb optical potential

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Collaboration

CBELSA/TAPS

Abstract content

The interaction of ω and η' mesons with nuclei has been studied in photo production off C and Nb targets, using the CBELSA/TAPS detector system. Transparency ratio measurements provide information on the inelastic cross section and in-medium width of mesons and thereby on the imaginary part of the meson-nucleus potential [1]. The real part of the optical potential can be deduced from measurements of the excitation function and momentum distribution which are sensitive to the sign and depth of the potential. Data taken on a C and Nb target have been analysed to determine the real and the imaginary part of the ω- and η'-nucleus optical potential. The momentum dependence of the imaginary part of the optical potential will be presented and discussed for both mesons. The results are compared to previous experimental results [2,3] and to model calculations assuming different scenarios for the in-medium properties of the ω and η' meson. The data are consistent with a weakly attractive potential for both mesons. The relatively small in-medium width of the η' meson encourages the search for η' bound states.

[1] M. Nanova et al., Phys. Lett. B 710 (2012) 600
[2] M. Nanova et al., Phys. Lett. B 727 (2013) 417
[3] M. Kotulla et al., Phys. Rev. Lett. 100 (2008) 192302

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