

Mesons in the medium - what have we learned?*

Wednesday, 13 September 2017 09:00 (30 minutes)

The in-medium modifications of hadron properties have been identified as one of the key problems in understanding the non-perturbative sector of QCD. Several theoretical papers discuss the possibility of a partial restoration of chiral symmetry in a strongly interacting environment. However, is it possible to find experimental evidence for partial symmetry restoration by studying the in-medium behaviour of mesons, in particular the meson-nucleus interaction? Is this interaction sufficiently strong to allow even the formation of mesic states only bound by the strong interaction? The answers can be given by studying the meson-nucleus interaction. In this presentation the experimental approaches to deduce the meson-nucleus potential and experimental results from CBELSA/TAPS will be discussed. Data taken on a C and Nb target have been analyzed to deduce the real and imaginary part of the η' - and ω -nucleus potential. The data for both mesons are consistent with a weakly attractive potential. The formation and population of ω -nucleus and η' -nucleus bound states will be discussed. In case of the ω meson the in-medium width is found to be larger than the potential depth which hampers a successful identification of ω -mesic states. The relatively small in-medium width of the η' meson encourages ongoing experiments to search for η' -nucleus bound states.

*Funded by DFG(SFB/TR-16)

Primary author: Dr NANOVA, Mariana (II. Phys. Inst., University of Giessen, Germany)

Presenter: Dr NANOVA, Mariana (II. Phys. Inst., University of Giessen, Germany)

Track Classification: Hadron physics with antiprotons