

ϕ meson mass and decay width in nuclear matter and nuclei

Friday, 29 September 2017 12:40 (20 minutes)

The mass and decay width of the ϕ meson in cold nuclear matter are computed in an effective Lagrangian approach. The medium dependence of these properties are obtained by evaluating kaon-antikaon loop contributions to the ϕ self-energy, employing the medium-modified kaon masses, calculated using the quark-meson coupling model. The loop integral is regularized with a dipole form factor, and the sensitivity of the results to the choice of cutoff mass in the form factor is investigated. At normal nuclear matter density we find a downward shift of the ϕ mass by a few percent, while the decay width is enhanced by an order of magnitude. For a large variation of the cutoff mass parameter, the results for the ϕ mass and the decay width turn out to vary very little. Our results support results in the literature which suggest that one should observe a small downward mass shift and a large broadening of the decay width. In order to explore the possibility of studying the binding and absorption of ϕ mesons in nuclei, we also present the single-particle binding energies and half-widths of ϕ -nucleus bound states for some selected nuclei.

Primary author: Dr COBOS-MARTINEZ, Javier

Co-authors: Prof. TSUSHIMA, Kazuo (CSSM, Adelaide University); Prof. KREIN, Gastao (UNESP); Prof. THOMAS, Anthony (University of Adelaide)

Presenter: Dr COBOS-MARTINEZ, Javier

Session Classification: Hadrons in matter including hypernuclei

Track Classification: Hadrons in matter including hypernuclei