

Measurement of the in-medium ϕ -meson width in proton-nucleus collisions

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Abstract

The production of ϕ -mesons in collisions of 2.83 GeV protons with C, Cu, Ag and Au targets has been measured with the ANKE magnetic spectrometer at the Cooler Synchrotron COSY. The ϕ was detected at small angles via its K^+K^- decay branch. The measured target mass dependence of the production cross section can be related to the in-medium ϕ width. Comparisons with available model calculations suggest a significant broadening of this width relative to the vacuum value of $4.3 \text{ MeV}/c^2$. Since this was a high statistics experiment, with 7000-10000 ϕ per target, we were able to study the momentum dependence of the in-medium ϕ width and results will be presented in the range $0.6 < p_\phi < 1.6 \text{ GeV}/c$.