Nuclear Theory

New Way to Produce Dense Double-Antikaonic Dibaryon System, \bar{K}\bar{K} NN, through Lambda(1405)-Doorway Sticking in p+p Collisions

Toshimitsu Yamazaki, Yoshinori Akaishi, Maryam Hassanvand

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A recent successful observation of a dense and deeply bound \bar{K} nuclear system, K^-pp, in the p + p \rightarrow K^+ + K^-pp reaction in a DISTO experiment indicates that the double-\bar{K} dibaryon, K^-K^-pp, which was predicted to be a dense nuclear system, can also be formed in p+p collisions. We find theoretically that the K^- -K^- repulsion plays no significant role in reducing the density and binding energy of K^-K^-pp and that, when two \Lambda(1405) resonances are produced simultaneously in a short-range p+p collision, they act as doorways to copious formation of K^-K^-pp, if and only if K^-K^-pp is a dense object, as predicted.

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