

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

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(Submitted on 16 Jun 2011)

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.

Comments: 8 pages, 9 figures, Accepted Apr. 19, 2011

Subjects: **Nuclear Theory (nucl-th)**; Nuclear Experiment (nucl-ex)

Journal reference: Proc. Jpn. Acad. Ser. B 87 (2011) 362-370; Received Jan. 6, 2011

Cite as: [arXiv:1106.3321](https://arxiv.org/abs/1106.3321) [nucl-th](or [arXiv:1106.3321v1](https://arxiv.org/abs/1106.3321v1) [nucl-th] for this version)

Submission history

From: Toshimitsu Yamazaki [[view email](#)]

[v1] Thu, 16 Jun 2011 19:49:06 GMT (1630kb)

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