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A Double Kaonic Nuclear System, Kbar Kbar NN, to be formed in pp colisions

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We have presented the idea that the simplest double-K nuclear cluster,K^-K^-pp, can be produced in the p+p −>K^+ +K^+ +Λ+Λ −>K^+ + K^+ + K^-K^-pp reaction, where Λ* is a quasi-bound K^-p state corresponding to Λ(1405). We have calculated the differential cross section for this process and found out that helped by a very large momentum transfer Q~ 1.8 GeV/c, a peak of K^-K^-pp cluster dominates in the mass spectrum when the cluster is a deeply bound and dense system. The incident proton energy for this process is around 7 GeV and increasing this energy enhances the cross section. We also found that the more bound system forms a more compact structure, and has a larger population. The K^- -K^- repulsion inside K^-K^-pp gives only a small change on the bound structure and the cross section.

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