

Friends of μ CF: exotic atoms, molecules and nuclei of antiprotons and \bar{K} mesons

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I present a topics on the kaonic nuclear molecule K^-pp , which has recently been predicted and studied profoundly [1]. It is the fundamental unit for “super strong nuclear force”, which is caused by a migrating K^- meson as:

$$\text{Super strong nuclear force : } K^-p + p \leftrightarrow p + K^-p. \quad (1)$$

This is a kind of revival of the abandoned Heitler-London=Heisenberg scheme for nuclear force.

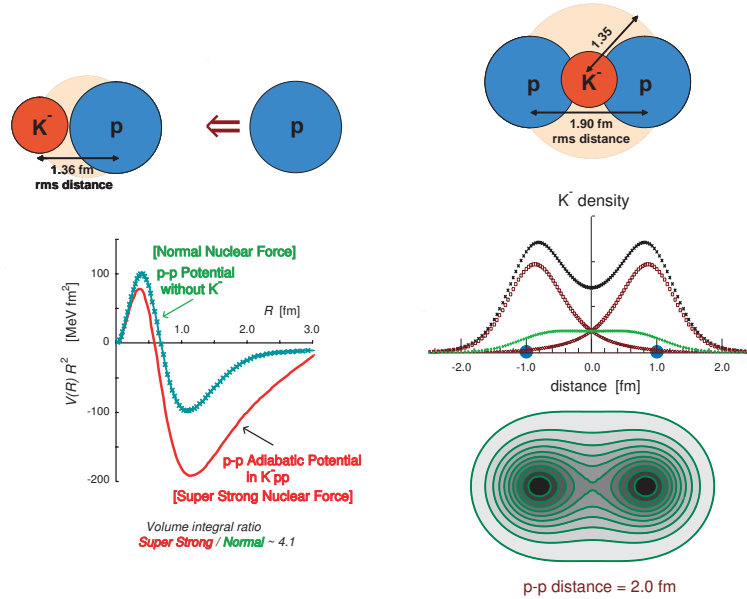


Figure 1: (Left) The adiabatic potential ($V(R)R^2$), when a proton approaches a bound K^-p “atom” (Λ^*), as a function of the distance between p and p . For comparison the Tamagaki potential for the normal V_{NN} interaction is shown. (Right) The molecular structure of K^-pp . The projected density distributions of K^- in K^-pp with a fixed $p - p$ distance ($= 2.0$ fm) and the corresponding K^- contour distribution are shown,

[1] T. Yamazaki and Y. Akaishi, Proc. Japan Acad. **B** (2007) in press.