

Extraction of $\Lambda\Lambda$ scattering length

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We have determined $\Lambda\Lambda$ scattering parameters from a $\Lambda\Lambda$ invariant mass spectrum that was obtained by the $^{12}\text{C}(K^-, K^+\Lambda\Lambda)$ reaction at the KEK Proton Synchrotron (KEK-PS E522). In a framework of the Watson's procedure, the value obtained scattering length $a_{\Lambda\Lambda} = -0.10^{+0.10}_{-2.47} \pm 0.04$ fm, and effective range $r_{\Lambda\Lambda} = 13.90^{>16.10}_{-13.90} \pm 9.48$ fm is the most consistent with the Nijmegen Soft Core (NSC97) models. However, the Nijmegen Hard Core ND (G-matrix), the Extended Soft Core 2000 (ESC00) model predictions are out of two-standard deviations of the determined scattering parameters. Figure 1 presents one-standard deviation band of the determined $\Lambda\Lambda$ -scattering parameter in a $(a_{\Lambda\Lambda}, r_{\Lambda\Lambda})$ plane.

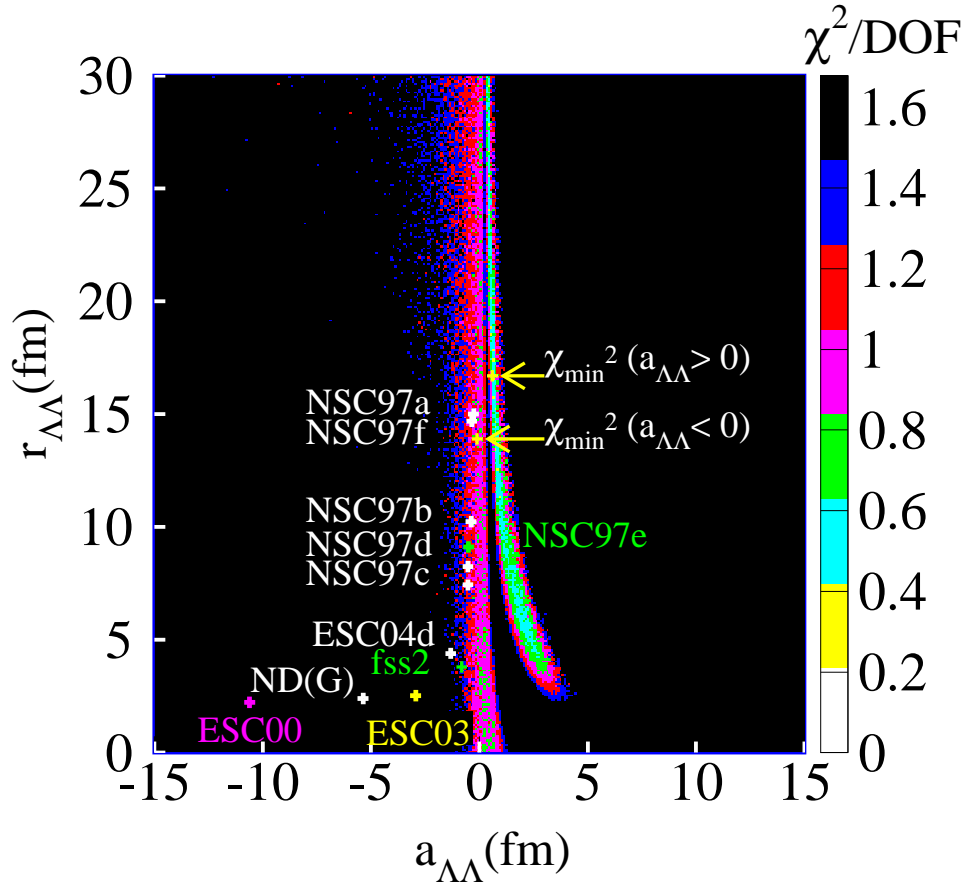


Fig 1. One standard deviation region ($\chi^2/\text{dof.} \leq (\chi^2_{\min}/\text{dof.}) + 1$) of the experimentally determined $\Lambda\Lambda$ scattering parameter.