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KbarN-piSigma coupled-channels potential derived from Chiral SU(3) dynamics

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In this talk, the derivation of a KbarN-piSigma coupled-channels potential from chiral SU(3) dynamics will be presented. Recently, precise experimental data of the energy shift of kaonic hydrogen have been obtained by SIDDHARTA. Thanks to these data, the uncertainty of the KbarN scattering amplitude has been significantly reduced below the KbarN threshold, which leads to the quantitative description of the Lambda(1405) and the subthreshold KbarN interaction.
For the application to the few-body kaonic nuclei, we previously established a potential construction method based on chiral SU(3) dynamics, respecting the properties of the scattering amplitude in the complex energy plane, and derived a KbarN signle-channel effective potential that incorporates the piSigma channel.
Extending this method to include the piSigma channel explicitly, we now proceed to construct a KbarN-piSigma coupled-channels potential, motivated by the fact that dynamical effects of the piSigma channel are expected to be particularly important in the energy region around the piSigma threshold. This potential reveals new aspects of the Lambda (1405) and will be useful for reliable predictions of kaonic nuclei.

Primary author: Mr MIYAHARA, Kenta (Kyoto university)

Co-authors: Prof. HYODO, Tetsuo (YITP); Prof. WEISE, Wolfram (ECT* and TU Munich)

Presenter: Mr MIYAHARA, Kenta (Kyoto university)

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