The Hypernuclei ${}^{4}_{\Lambda}$He and ${}^{4}_{\Lambda}$H with Modern YN Interactions

H. Kamada[a], A. Nogga[b] and W. Glöckle[c]

[a] *Department of Physics, Faculty of Engineering, Kyushu Institute of Technology, Kitakyushu 804-8550, Japan*
[b] *Department of Physics, University of Arizona, Tucson, Arizona 85721, USA*
[c] *Institut für theoretische Physik II, Ruhr-Universität Bochum, D-44780 Bochum, Germany*

The hypernuclei ${}^{4}_{\Lambda}$He and ${}^{4}_{\Lambda}$H provide important information on the hyperon-nucleon interaction. We present accurate Faddeev-Yakubovsky calculations for the Λ separation energy of the 0^+ ground and the 1^+ excited states based on the Nijmegen SC YN interactions. We explicitly take the Σ admixture to the wave function into account. There is no uncontrolled approximation, neither of the interaction nor solving the dynamical equations. Mass differences of the baryons and the charge-dependence of the interaction are considered. The results show that the Nijmegen models cannot predict all separation energies simultaneously hinting to failure of the current interaction models.

References

[1] A. Nogga, H. Kamada and W. Glöckle, Phys. Rev. Lett. **88** (2002) 172501.