



NUSTAR / Theory Seminar

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Wednesday, June 26, 2019 at 13:30 p.m.

Seminar Room KBW 2.27

GSI, Planckstraße 1, 64291 Darmstadt

“Ab initio shell-model study of nuclear observables for sd shell nuclei”

In this talk I will present first ab initio shell-model results of electromagnetic properties [1], GT strengths [2], spectroscopic factor strengths [3], and beta decay half-lives [4] of sd shell nuclei using valence-space Hamiltonians derived from two ab initio approaches: the in-medium similarity renormalisation group (IM-SRG) and the coupled-cluster effective interaction (CCEI). Results are in a reasonable agreement with the available experimental data as well as with the results from the phenomenological USDB effective interaction. At the end I will also show shell model results for ^{21}Mg [5] and ^{28}Mg for recent TRIUMF experimental data.

[1] A. Saxena and P.C. Srivastava, First-principles results for electromagnetic properties of sd shell nuclei, Phys. Rev. C 96, 024316 (2017)

[2] A. Saxena, P.C. Srivastava and T. Suzuki, Ab initio calculations of Gamow-Teller strengths in the sd shell, Phys. Rev. C 97, 024310 (2018).

[3] P.C. Srivastava and V. Kumar, Spectroscopic factor strengths using ab initio approaches, Phys. Rev. C 94, 064306 (2016).

[4] Anil Kumar, P.C. Srivastava and T. Suzuki, Ab initio results of nuclear beta - decay half-lives of sd shell nuclei (arXiv:1811.09367).

[5] P. Rutsalainen, J. Henderson, G. Hackman, G.H. Sargsyan, K.D. Lainey, A. Saxena, P.C. Srivastava et al., Isospin symmetry in $B(E2)$ values: Coulomb excitation study for ^{21}Mg , Phys. Rev. C 99, 051302 (R) (2019).