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New evidence for alpha clustering structure in the ground state band of ^{212}Po

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The isotope ^{212}Po has two-protons and neutrons outside the doubly-magic nucleus ^{208}Pb and it may be assumed that the nuclear structure can be well described within the standard shell-model. But various experimental properties, such as the short-lived ground state are inconsistent with this model and better predicted by an α-clustering model. The B(E2) values of the decays of the low lying yrast-states are an important finger print to describe the structure of ^{212}Po. Especially the missing B(E2; $4_1^+ \rightarrow 2_1^+$), and the corresponding missing lifetime of the 4_1^+ state, are important in this discussion.\\
At the end of 2019, we had performed an experiment to determine the lifetime of the low-lying yrast states at the Bucharest FN Tandem accelerator in the Horia Hulubei National Institute for R\&D in Physics and Nuclear Engineering (IFIN-HH) in Magurele, Romania. ^{212}Po were populated by an α-transfer reaction between a ^{208}Pb target and a stable ^{10}B beam. The γ-rays from the excited states are detected at the ROSPHERE γ-ray detector array which consisted of 15 HPGe detectors and 10 $LaBr_3$(Ce) scintillator detectors. To detect coincidence particles, this setup was supplemented with the SORCERER particle detector system. The combination of γ-ray and the particle detectors was an important tool to determine the mean lifetimes of all ground state band levels up to the 8^+ state applying the fast-timing method.\\
In this talk, I will present our lifetime analysis of the excited states of ^{212}Po and will discuss the results within the shell-model and α-clustering model.

Primary authors: VON TRESCKOW, Martin (TU Darmstadt); Prof. KRÖLL, T. (TU Darmstadt); RUDIGIER, Matthias (TU Darmstadt); SHNEIDMAN, T.M. (Joint Institute for Nuclear Research, Dubna)

Co-authors: BOROMIZA, M. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); CLISU, C. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH),); COSTACHE, C. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); FILIPESCU, D. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH),); FLOREA, N.M. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); GHEORGHE, I. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); GLADNISHKI, K. (Faculty of Physics, St. Kliment Ohridski University of Sofia); IONESCU, A. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); KOCHEVA, D. (Faculty of Physics, St. Kliment Ohridski University of Sofia); LICA, R. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); Dr MARGINEAN, N. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); MARGINEAN, R. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); MASHTAKOV, K.R. (University of Guelph); MIHAI, C. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); MIHAI, R.E. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); NEGRET, A. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); NITA, C.R. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); OLACEL, A. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); OPERA, A. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); PASCU, S. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); RAINOVSKI, G (Faculty of Physics, St. Kliment Ohridski University of Sofia); SAVA, T. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); SCHECK, M. (University of the West of Scotland); SOTTY, C. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); SPAGNOLETTI, P. (Simon Fraser University); STAN, L. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); STIRU, I. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); TOMA, S. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); TURTURICA, A. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH)); UJENIUC, S. (Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH))

Presenter: VON TRESCKOW, Martin (TU Darmstadt)

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