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Lifetime Measurements in Neutron-rich Pb Isotopes. Exploring the Nuclear Structure around the N=126 Shell

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The neutron-rich part of the nuclear chart and, in particular, the regions around double-shell closures have been studied in detail revealing intriguing phenomena. However, around the ^{208}Pb nucleus, there is still a lack of spectroscopic information, especially regarding lifetimes of nuclear excited states. Large shell model calculations performed for Pb isotopes typically reproduce the experimental level scheme energies but fail to reproduce the reduced transition probabilities.
This proposal aims to investigate the shell evolution in the region of the double magic ^{208}Pb isotope involving the neutron $g_{9/2}$ shell through the lifetime determination of the lowest lying yrast excited states in ^{211}Pb. In particular, the main goal will be to determine the $B(E2 : 17/2^+ \rightarrow 13/2^+)$ and $B(E2 : 13/2^+ \rightarrow 9/2^+)$ transition strengths in ^{211}Pb which would provide the testing ground of recent large-scale shell-model calculations for evaluating the performance of the effective three-body forces in heavy systems.
We propose lifetime measurements in ^{211}Pb employing AGATA+Prisma setup coupled to a plunger device in the reverse configuration.
Finally, the evaluation of the production of ^{212}Pb and ^{208}Hg isotopes will be done by the study of the emission of the γ-rays from the $4^+ \rightarrow 2^+$ and $2^+ \rightarrow 0^+$ transitions.

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