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Lifetime measurements in the south region of Pb using AGATA+PRISMA+NOSE+Plunger

Nuclei in the vicinity of 208Pb are a good testing ground for different models and in particular those differing from the doubly closed shell by a few particles such as 206Hg or 204Pt. This region has been explored in the past using fragmentation reactions [1,2], multi-nucleon transfer [3] allowing to measure lifetimes of isomeric states and perform spectroscopy of states below the isomers. On the contrary, experimental information for nuclei in the south of 208Pb, especially on reduced transition probabilities is scarce.
The recently measured B(E2: $2^+ \rightarrow 0^+$) value in 206Hg via Coulomb excitation, found to be lower than for other lighter Hg isotopes, opens up the prospect to study other nuclei in the region [4]. Moreover large scale shell model calculations performed for Pb nuclei are able to reproduce the excitation energies but fail to reproduce transition probabilities [5]. Information on the evolution of quadrupole collectivity with the neutron number, for nuclei on the south of 208Pb, would provide a great opportunity to study and address several questions regarding the nuclear structure in this region.

We aim to measure lifetimes in the southwest region of 208Pb by employing a multi-nucleon transfer reaction, a beam of 208Pb with energy 7 MeV/u impinging on a Sn target. AGATA will be coupled to the NOSE [6] which is composed of a MWPPAC and a Bragg ionization chamber, providing information on the position, total energy and charge. NOSE has been successfully used in the past employing the 197Au+130Te reaction [7]. Heavy partners from the reaction will be sent in NOSE and be identified, providing the needed channel selectivity and doppler correction on an event-by-event basis.

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Authors: BRUGNARA, Daniele (Istituto Nazionale di Fisica Nucleare); VALIENTE DOBON, Jose' Javier (Istituto Nazionale di Fisica Nucleare); PELLUMAJ, Julgen (Istituto Nazionale di Fisica Nucleare)

Presenter: BRUGNARA, Daniele (Istituto Nazionale di Fisica Nucleare)

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