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Study of shell evolution around the doubly magic ^{208}Pb, via a multi-nucleon transfer reaction at MINIBALL

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Study the east region around the doubly magic ^{208}Pb, represents an ideal testing ground to understand the effects related to the effective three-body forces, i.e., if the large calculations are feasible and the seniority scheme provides useful guidance. However, this region of the Segrè chart has been traditionally difficult to access experimentally due to its neutron richness and low cross sections. Even with the new improvements and the new facilities, we still have lack of information around this region.
On the other hand, multi-nucleon transfer reaction has been proved for many years an important tool in order to investigate exotic nuclei with stable beams. With this technique it is possible to excite high spins states, to find new isomers and to understand the band structure of a nucleus. In addition, in one experiment you will be able to investigate different isotopes at the same time.
The aim of this experiment is twofold: i) firstly, it will represent the proof of principle that multi-nucleon transfer reactions with unstable beams is efficient to populate neutron-rich heavy binary partners, and represents a competitive method to cold fragmentation ii) secondly, we aim at populating medium- to high-spin states in ^{212,214}Pb and ^{208,210}Hg to elucidate the existence of the 16^+ isomer in the lead isotopes, and at the same time to disentangle the puzzling case of a very low energy 3^- state in ^{210}Hg not described by any nuclear model.
On this way, the first multi-nucleon transfer experiment with radioactive beam (RIB) was carried out in September of this year. Very preliminary results will be presented.

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