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First results on Ge resonant laser photoionization in hollow cathode lamp

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In the framework of the research and development activities of the SPES project regarding the optimization of the radioactive beam production, a dedicated experimental study has been recently started in order to investigate the possibility of laser ionization in-source production of Germanium using a set of tunable dye lasers.

Germanium is in fact one of the candidates beams to be accelerated by the SPES ISOL facility, which is under construction at Legnaro INFN Laboratories.

The three-step, two color ionization schemes have been tested along with a Ge Hollow Cathode Lamp (HCL). The "slow" and the "fast" optogalvanic signals were detected and averaged by an oscilloscope as a proof of the laser ionization inside the lamp.

As results, several wavelength scans across the resonances of ionization schemes were collected with the "fast" optogalvanic signal. Some comparisons of ionization efficiency for different ionization schemes were made. Furthermore saturation curves of the first excitation levels have been obtained.

This investigation method and the set-up built in the laser laboratory of the SPES project can be applied for the photo-ionization scheme studies also for the other possible RIB elements.

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