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New Calibrated Evaporation Oven for Time of Flight Mass Spectrometer in Offline SPES Laser Laboratory

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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 new home-made Time of Flight Mass Spectrometer (ToF-MS) has been built in the off-line laser laboratory.
Thanks to this instrument it is possible to test resonant laser ionization processes of stable species, to evaluate their ionization efficiency and even isotope separation capability.
Nowadays a Nd:YAG laser is used to evaporate atoms by laser ablation in the spectrometer, making these atoms available for laser resonant ionization processes.
The new evaporation oven, replacing the ablation system, is designed to guarantee a more stable and calibrated atom flux, making possible laser ionization efficiency measurements, which are inapplicable with the current system.
This work will present the design of the new graphite oven system, its preliminary heating tests, and first measurements aimed to evaluate the evaporation profile generated by the heated furnace.
Furthermore, in its final realization, the ToF-MS with the new evaporation oven system will be used, coupled to a standard SPES hot cavity and extraction system, to realize a test bench machine for deeper laser ionization efficiency measurements applicable for the SPES laser ion source.

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