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Development and commissioning of new Decay Spectroscopy Station at CRIS with 75Zn

Laser spectroscopy can study many ground-state properties (spin, nuclear electromagnetic moments, changes in the charge radius) of the nucleus which can challenge state-of-the-art nuclear models, and enhance our understanding of the nuclear forces. Furthermore, its application at ISOL facilities can give access to the same properties of long-lived states (>10ms). One major challenge that laser spectroscopy at ISOL facilities faces is the presence of isobaric contaminants that can increase the background signal significantly. This is most detrimental for low-yield isotopes, making these isotopes inaccessible. The Decay Spectroscopy Station (DSS) can solve this problem by combining laser and decay spectroscopy in decay-assisted laser spectroscopy, which can tag the isomer of interest based on its decay. Experimental work on previous designs of the DSS at ISOLDE/CERN has been performed successfully on neutron-rich potassium (Z=19) [1] and francium (Z=87) [2-4]. \\
Conversely, laser-assisted decay spectroscopy can also be performed with the DSS at CRIS by tagging the isomer of interest based on its ionisation scheme. This is crucial to measure the decay scheme of isomers with similar half-lives, as conventional methods cannot easily discern between isomers with similar half-lives. This was successfully performed with a previous design on francium (Z=87) [3-4]. \\\\
Recently there has been an effort to upgrade the previous design of DSS to include a tape station and a dedicated beta-detection setup. I will present this new design, the upgrades implemented, and the upgrades planned for the future. Further, I will present the results from the commissioning on ^{75}Zn.

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Abstracts

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