Contribution ID: **60** Type: **Oral Presentation**

Comparison of modelling and measurements of resonance laser ionisation of zinc isotopes

Monday, 4 July 2022 15:00 (15 minutes)

Pure isotopes of zinc find application in the production of radiopharmaceuticals for medical diagnostic scans (68-Zn and 67-Zn). Enrichment processes relying on mass differences do not produce products of sufficient purity for medical applications, therefore resonance laser ionisation is a potential final step in the purification process.
An experimental setup for resonance laser ionisation of zinc vapour, followed by time of flight mass spectrometry was used to investigate a promising ionisation scheme, using both the singlet and triplet energy levels of Zn. It was complemented by the development of a numerical model. The rate equations of Zn are solved in every segment of the sample along the laser beam path, to yield the changes in population of atomic energy levels and the light absorption per segment. Comparison of experimental and model results are presented, as well as extrapolations of model results to long and dense media and high laser power.

Apply to be considered for a student ; award (Yes / No)?

No

Level for award;(Hons, MSc, PhD, N/A)?

Not applicable

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Session Classification: Photonics

Track Classification: Track C - Photonics