Contribution ID: **48** Type: **Poster (In person)**

Vacuum-ultraviolet spectroscopy of thorium-229m: En route towards a solid-state nuclear clock

Wednesday 30 November 2022 18:22 (2 minutes)

A unique feature of thorium-229 is its isomeric first excited state with an exceptionally low excitation energy, proposed as a candidate for future nuclear optical clocks serving as a versatile quantum sensor for fundamental physics [1]. A novel approach to populate the isomeric state in radioactive decay using the beta decay of actinium-229 is studied at ISOLDE as an alternative to the 'traditional'alpha decay of uranium-233 [2].

In this contribution, results from recent vacuum-ultraviolet spectroscopic measurements of the isomer's radiative decay using a A=229 beam implanted into large-bandgap MgF2 and CaF2 crystals are presented [3]. The observation of the radiative decay in such media marks an important milestone in the development towards a solid-state nuclear clock.

[1] E Peik et al., Quantum Sci. Technol. 6 034002
[2] M. Verlinde et al., Physical Review C, 100, 0
[3] S. Kraemer et al., arXiv:2209.10276 [nucl-ex]

Author: KRAEMER ON BEHALF OF THE IS658 COLLABORATION, Sandro (Ludwig Maximilians Universitat (DE))

Presenter: KRAEMER ON BEHALF OF THE IS658 COLLABORATION, Sandro (Ludwig Maximilians Universitat (DE))

Session Classification: Poster Session