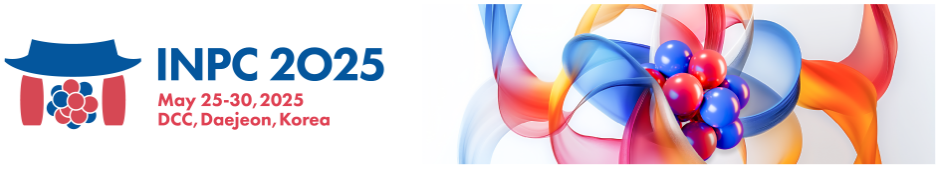

Contribution ID: **576** Type: **Contributed Oral Presentation**

First Identification of Excited States in ^{78}Zr and Implications for Isospin Non-Conserving Forces in Nuclei

Thursday, 29 May 2025 16:30 (15 minutes)

Isospin symmetry is a fundamental concept arising from the assumed charge symmetry and charge independence of the strong nuclear force. However, a wealth of experimental evidence has revealed isospin non-conserving interactions, which manifest, for example, in the excitation energies of analog states in T = 1 triplet nuclei. Until recently, the triplet energy difference (TED) data were available for A = 42 to A = 74 isobaric triplets, but have now been extended to cover the A = 78, T = 1 triplet, which is currently the heaviest system for which complete TED data exist.
A fusion-evaporation reaction study conducted at the Accelerator Laboratory of the University of Jyvaskyla led to the first observation of the 2^+ and, tentatively, the 4^+ excited states in the N = Z - 2 nucleus ^{78}Zr [1]. This study also provided new structural information for the N = Z nucleus ^{78}Y. These results were obtained using the JUROGAM 3 Ge-array coupled with the vacuum-mode mass separator MARA, along with employing the recoil-β and recoil-β-β correlation techniques. This presentation will discuss the new experimental results for the A = 78 triplet, which appear to be inconsistent with those obtained from contemporary theoretical calculations based on both the shell model and density functional theory.

References:
[1] G.L. Zimba, P. Ruotsalainen, D.G. Jenkins, W. Satula et al., Phys. Rev. Lett., Accepted 12 November, 2024

Primary authors: ZIMBA, George (Central Michigan University); RUOTSALAINEN, Panu (University of Jyväskylä); JENKINS, David (University of York); Dr SATULA, Wojciech (University of Warsaw); AL., et

Presenter: RUOTSALAINEN, Panu (University of Jyväskylä)

Session Classification: Parallel Session

Track Classification: Nuclear Structure