Decay spectroscopy studies on the two new isotopes of astatine*

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Two lightest known isotopes of astatine, ^{188}At and ^{190}At, were identified in the Accelerator Laboratory of University of Jyväskylä, Finland. The nuclei were produced in fusion-evaporation reactions, and those were subsequently separated from the primary beam using the RITU (Recoil Ion Transfer Unit) gas-filled recoil separator. A proton emission from ^{188}At was detected, resulting to the observation of the heaviest known proton-emitting nucleus to date. The non-adiabatic quasiparticle model was expanded to interpret the experimental data, suggesting that the proton is emitted from a prolate deformed (2^-) state, with a dominant $s_{1/2}$ proton component in the wavefunction. The one-proton separation energy deviates from the systematics, and a possible source for this effect will be discussed in this presentation. For the second lightest known astatine isotope, ^{190}At, α-decay properties were measured and compared to the systematics. Additionally, the possibility of proton emission from this nucleus is discussed. In this presentation, the experimental details and the results of forthcoming publication of ^{188}At [1] and the already published ^{190}At [2] will be presented.

[1] H. Kokkonen, K. Auranen *et al.*, to be published.
[2] H. Kokkonen, K. Auranen *et al.*, Phys. Rev. C **107** (2023) 064312

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