

The ^{74}Zn AGATA puzzle

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The E2 transition probability of the $4+1$ state in ^{74}Zn remains a puzzle. The safe Coulomb excitation experiment performed at ISOLDE at 3 MeV/u is compatible with a maximum of collectivity as expected for a mid-neutron $g_{9/2}$ shell nucleus and supported by the shell model calculations. However, the first plunger experiment performed at AGATA+PRISMA using multi-nucleon transfer (MNT) at LNL in 2010 shown on the contrary an unexpected decrease of the collectivity from ^{72}Zn to ^{74}Zn . The long lifetime of the $4+$ state was later confirmed using another MNT reaction and a plunger at AGATA + VAMOS in 2016. Recently, the safe Coulomb excitation was done at higher energy at HIE-ISOLDE leading to an intermediate value. The disagreement is very puzzling since the two MNT reactions with plunger lead independently to the same value. It could be speculated that an unknown transition is feeding the $4+$ with a lifetime in the range of $\tau > 100$ ps. We propose to revisit the ^{74}Zn case by MNT in a dedicated experiment, without plunger, to clarify the level scheme and search for a long-lived feeder using the geometrical DSAM effect in AGATA thanks to its unprecedented resolving power coupled to PRISMA. If the statistic is sufficient, an angular distribution will be performed to tentatively assign spin/parity to the state feeding the $4+1$ state.

Full proposal at <https://u.ganil-spiral2.eu/cloud/index.php/s/SRqbi15C327J7PE>

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