

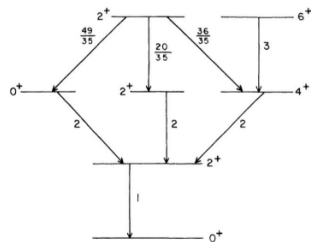
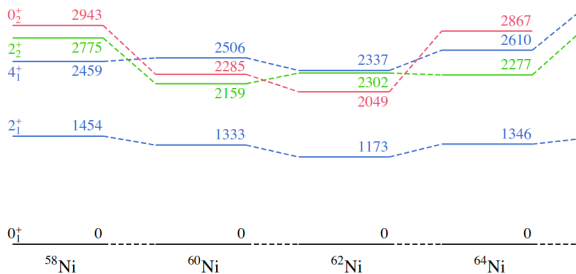
Report on AGATA@LNL experiment 23.08: Coulomb excitation of ^{60}Ni

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University of Warsaw



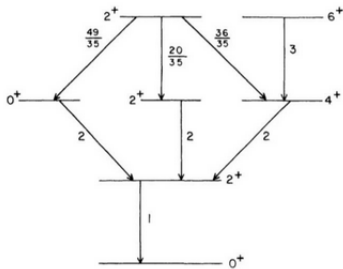
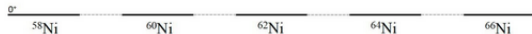
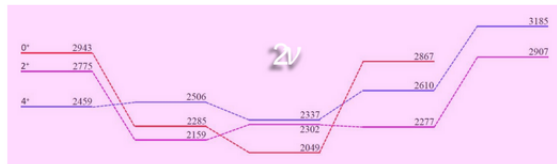
Vibrational limit: predicted transitions



$B(E2)$ VALUES FOR DECAY OF MULTI-PHONON STATES

See: The emergence of enhanced collectivity near magic nuclei: Coulomb excitation of ^{60}Ni

Vibrational limit: predicted transitions



B(E2) VALUES FOR DECAY OF
MULTI-PHONON STATES

B(E2) and Qs values needed
Not only the level scheme but the structure

Large E0 strengths between low-lying states

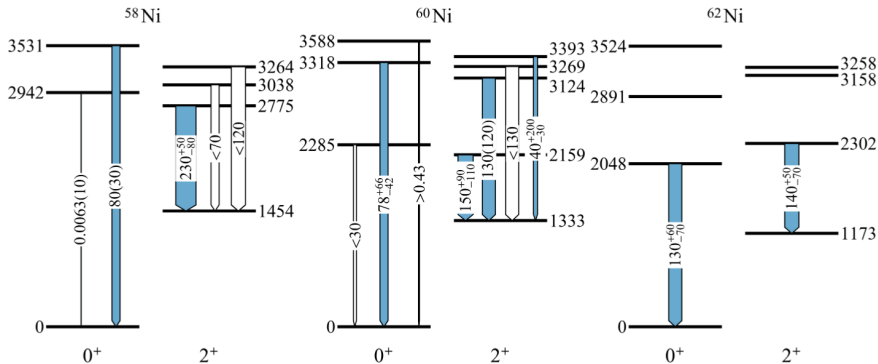
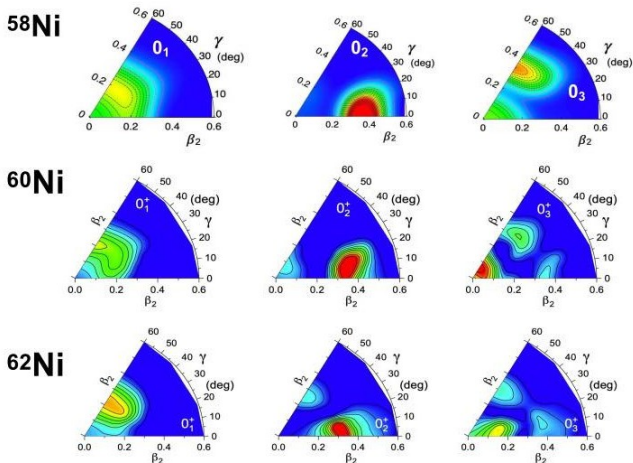


Figure taken from L.J. Evitts et al., Phys. Rev. C 99 (2019) 024306.

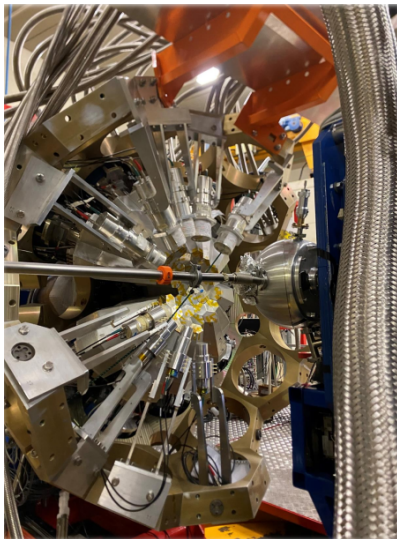
Multiple shape coexistence

Beyond Mean Field model predictions (T. Rodriguez):

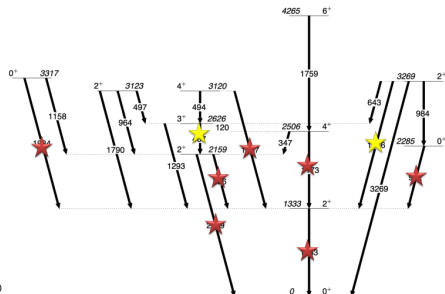
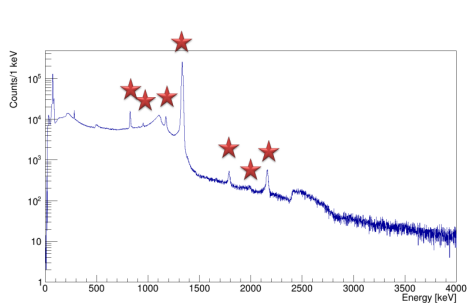


Experiment 23.08: Coulomb excitation of ^{60}Ni details:

- October 2023 (6 days)
- TANDEM XTU @ INFN LNL
- ^{60}Ni beam, 240 MeV, $I \approx 2$ p nA
- ^{208}Pb , 0.8 and 4 mg/cm²
- AGATA, 34 crystals
- SPIDER, 7 sectors, 8 rings:
128°-160°



Nearline Doppler-corrected gamma spectrum



Ongoing AGATA analysis

- Calibration with ^{60}Co ;
- Neutron Damage;
- Calibration with ^{152}Eu ;
- Global time alignment;

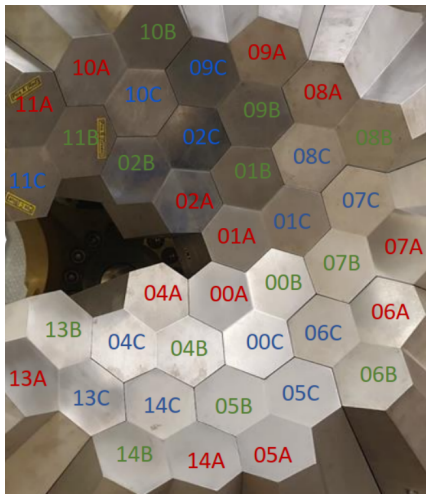


Photo source: R.M. Pérez-Vidal - AGATA Analysis Workshop 2025 PostPSA Calibration.
Hands on 14/01/2025, Lyon

Ongoing AGATA analysis

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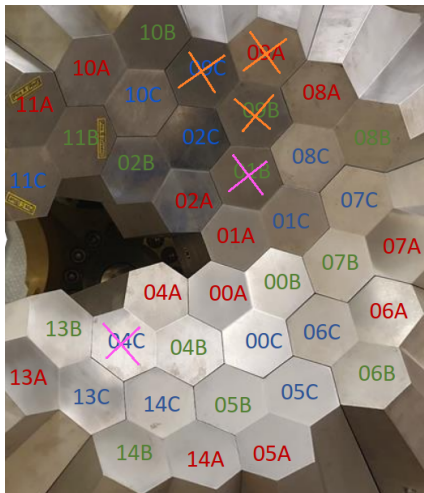
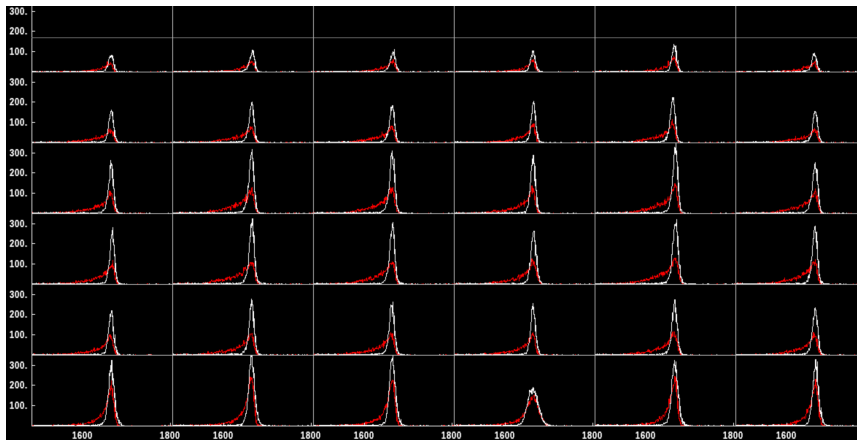


Photo source: R.M. Pérez-Vidal - AGATA Analysis Workshop 2025 PostPSA Calibration. Hands on 14/01/2025, Lyon

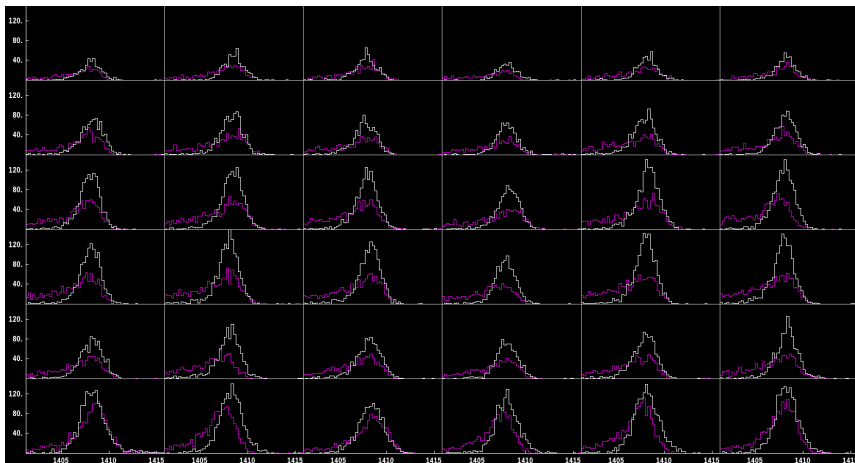
^{60}Co Double structure in timing spectra



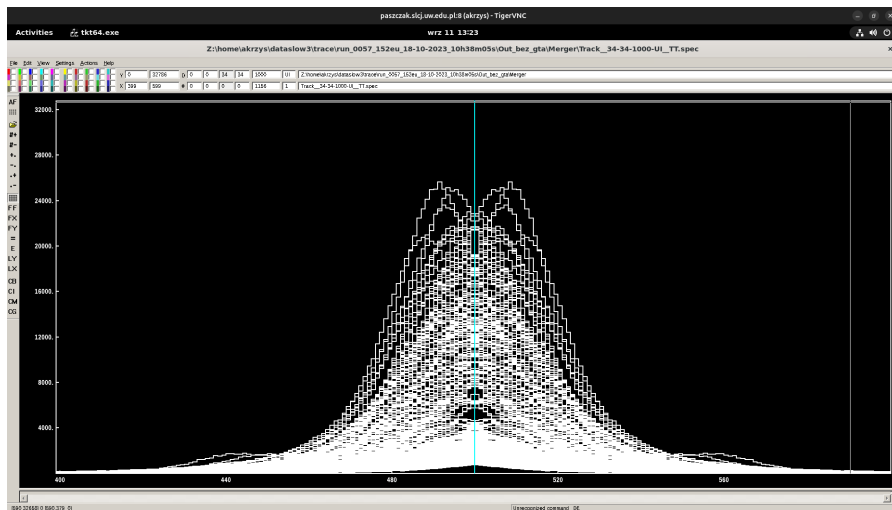
^{60}Co Neutron damage correction (1333 keV)



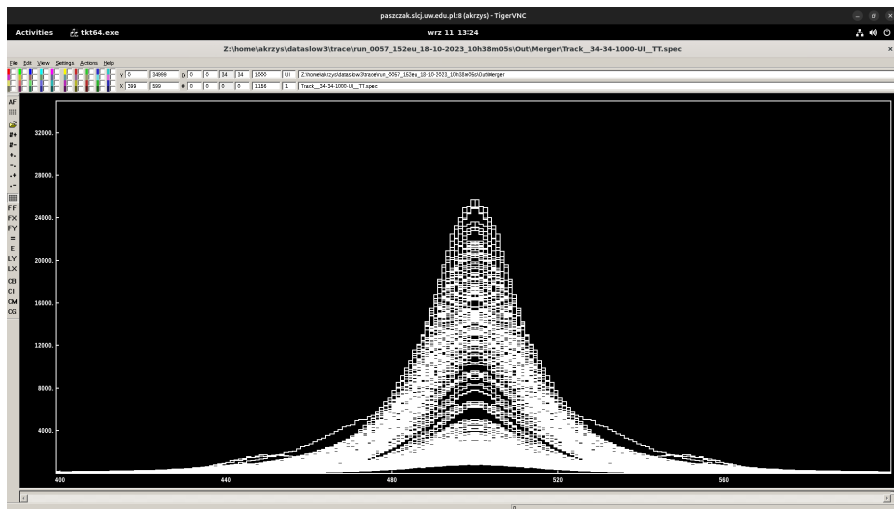
^{152}Eu Neutron damage correction (1408 keV)



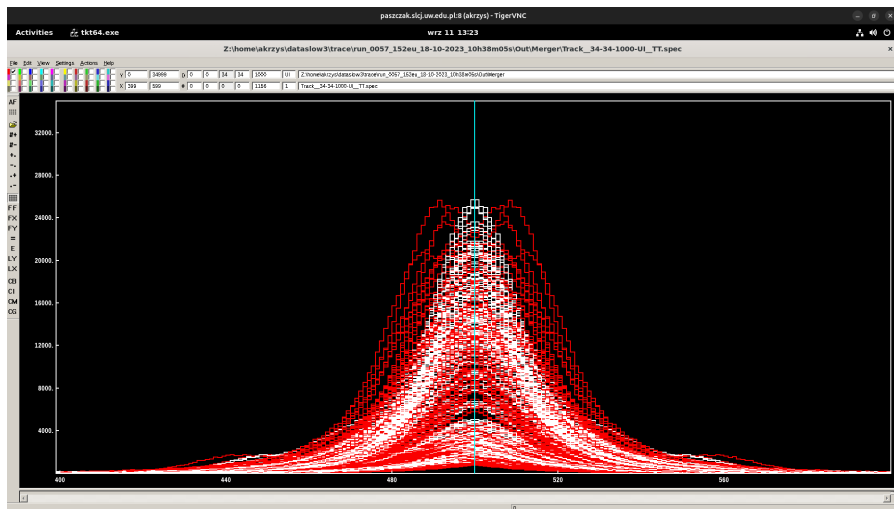
^{152}Eu Global time alignment - before



^{152}Eu Global time alignment - after



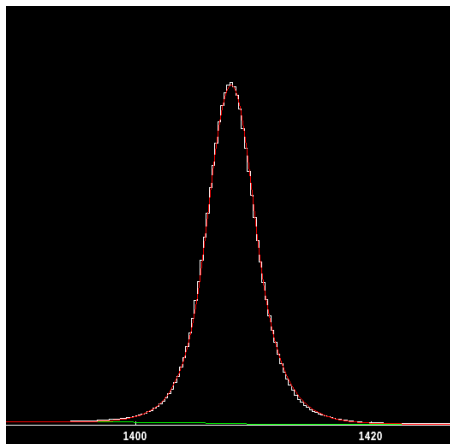
^{152}Eu Global time alignment - comparison



^{152}Eu Total energy spectrum

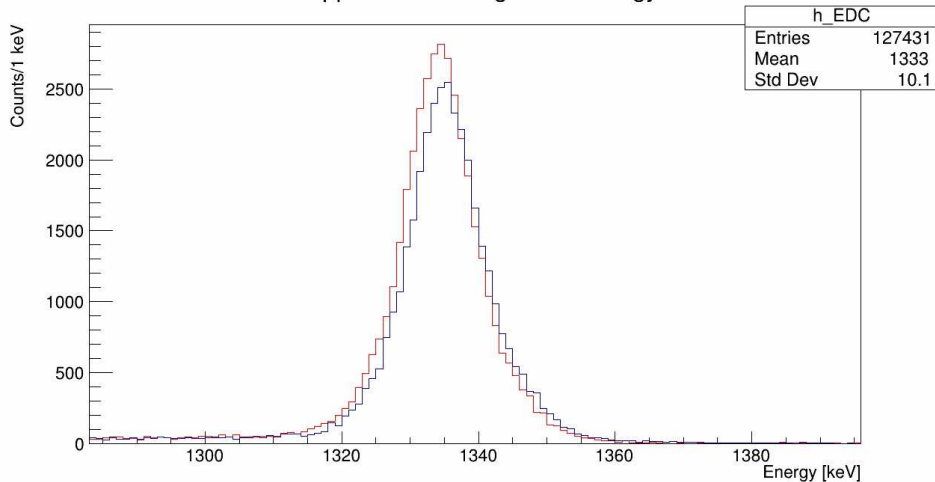
Fit parameters:

- Centroid:
(1408.101 $\pm$ 0.0039) keV
- FWHM:
(4.786 $\pm$ 0.0011) keV



^{60}Ni Doppler correction

Doppler corrected gamma energy



To-do list:

- Optimisation of the SPIDER array (energy, angles)
- Particle-gamma time coincidence selection
- Optimisation of the Doppler correction
- Coulomb excitation data analysis

Thank you!