

Study of $N \geq Z$ proton drip line nuclei $^{96,97,98}\text{Cd}$

Exp N: S352

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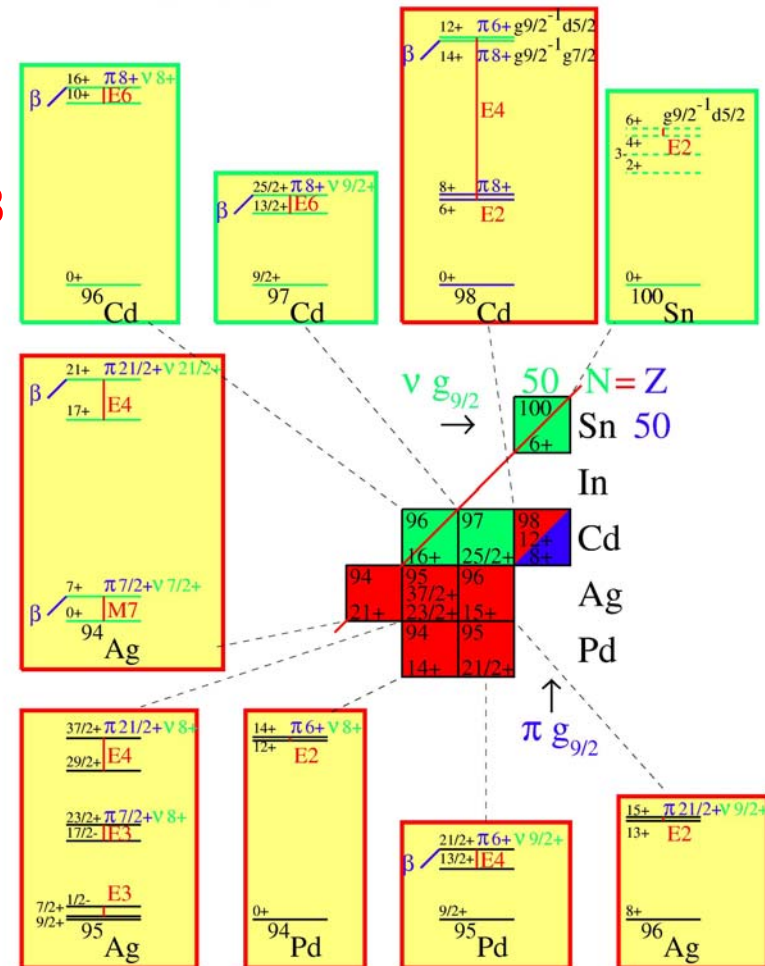
- ✿ **Motivation**
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Motivation

- ✿ Study the isospin symmetry as a function of mass, at $N \sim Z$.
- ✿ Shell Model residual interaction.
- ✿ Study the neutron-proton pairing.
- ✿ Study the competition between pairing and deformation for $N \sim Z$, $A \sim 90-100$ (the π and ν occupy the $g_{9/2}$ shell).
- ✿ r-p process

$^{96}_{48}\text{Cd}_{48}$

Spin gap isomers below $N=Z=50$

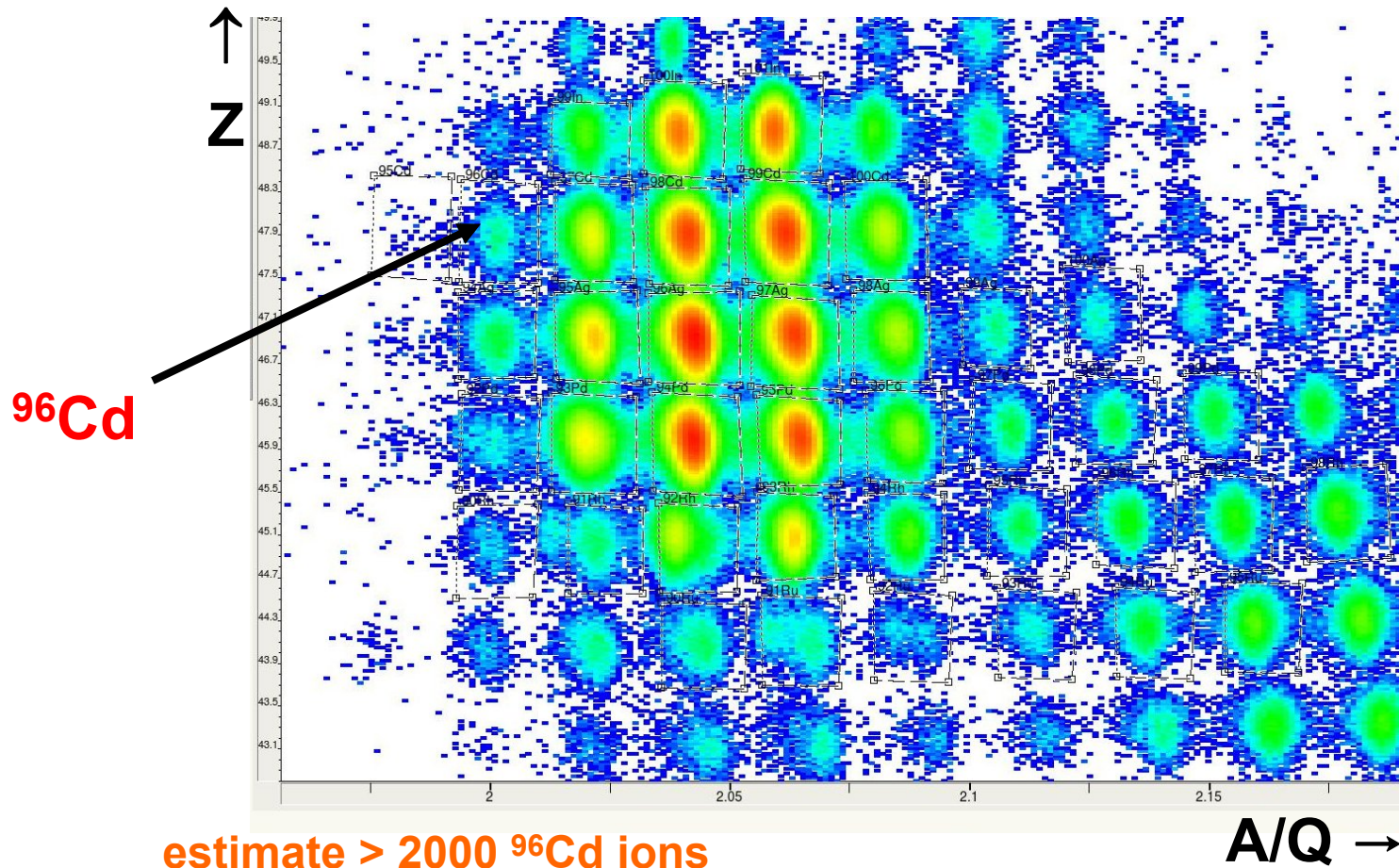


Preliminary results

July 2008: 15 of 30 approved shifts

^{124}Xe : 850 MeV/A ($I_0 \sim 10^9$ pps) on ^9Be primary target

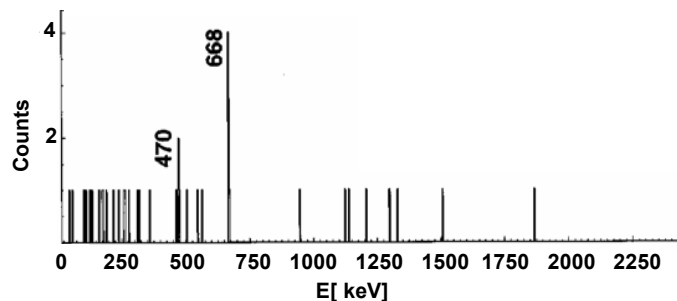
RISING Ge array + active stopper to search for γ 's β 's and β - p decays



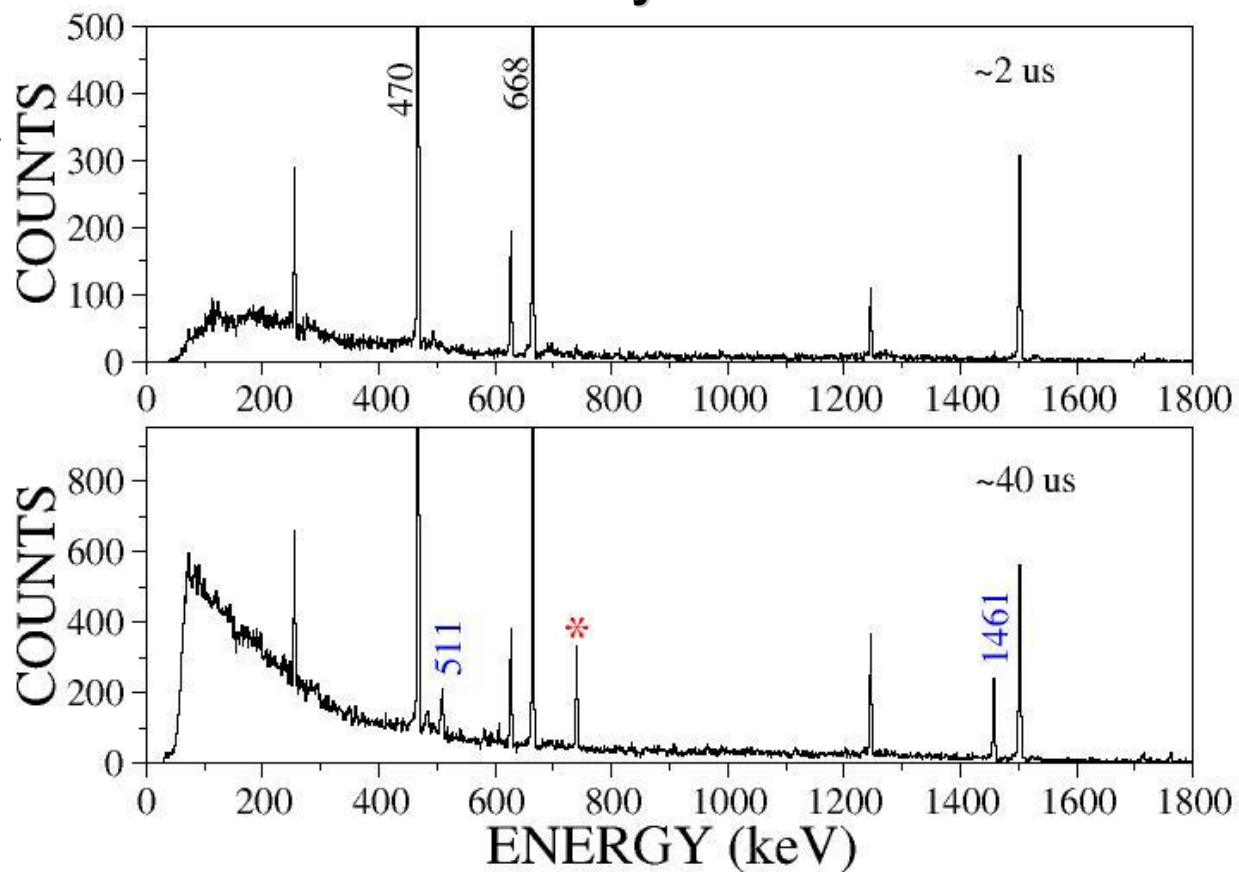
Preliminary results ^{96}Ag

GANIL

R. Grzywacz et al., PRC 55, 1126 (1997)



GSI: July 2008



Why more data is needed?

✿ Statistics for γ - γ coincidence studies

In the data from July 2008:

$N(^{96}\text{Cd}) \sim 2000$

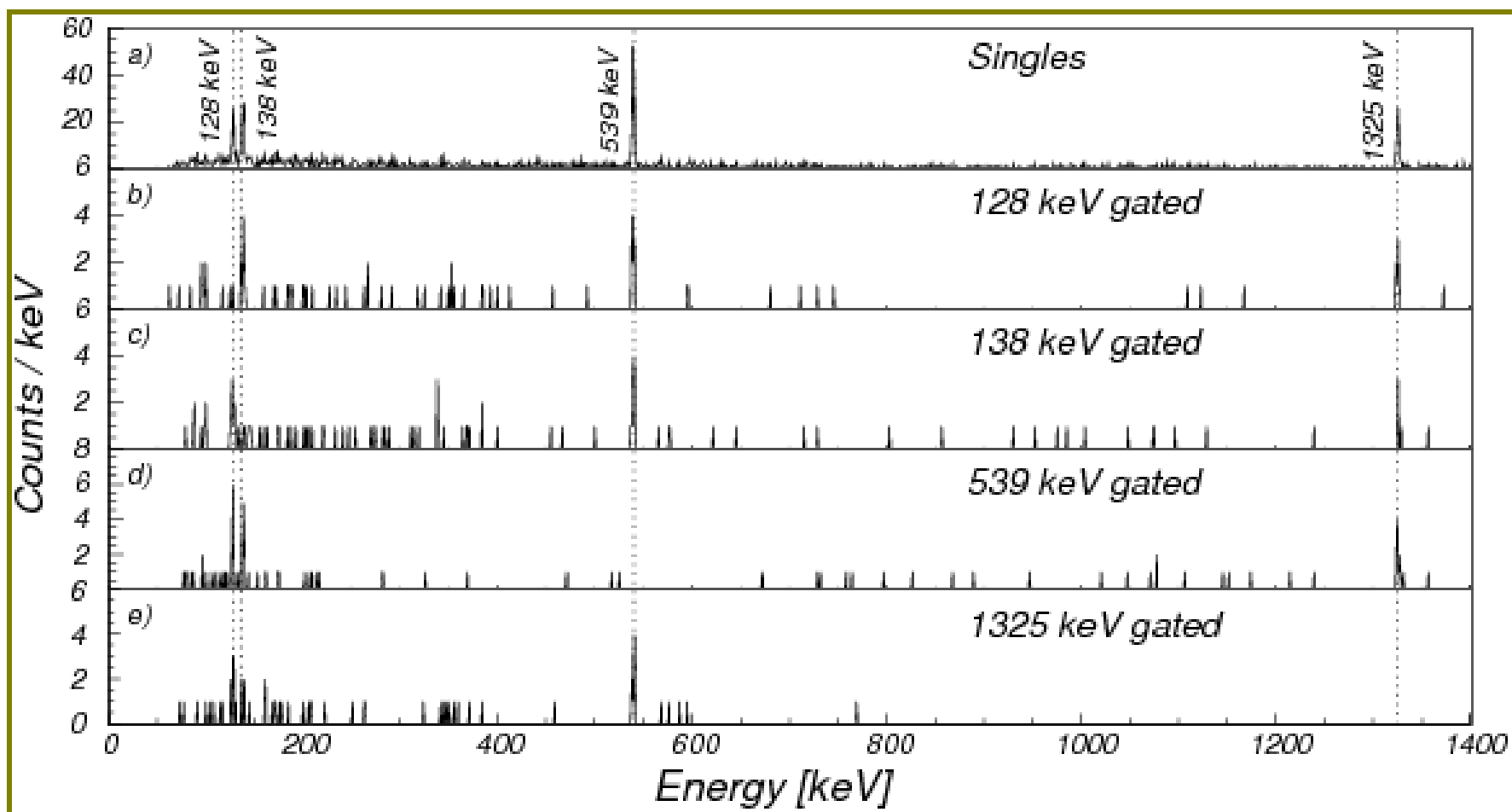
$\epsilon_\gamma = 15\%$ (at 1 MeV)

Isomeric ratio $\sim 5\%$

$$N_{\gamma-\gamma} = 2000 * 0.15 * 0.15 * 0.05 \geq 2$$

Remaining Shifts: 15
and 9 Parasitic Shifts

^{130}Cd



A. Jungclauss, L. Cáceres et al., Phys. Rev. Lett 99, 132501 (2007).

Required experimental equipment.

S/S:

^{124}Xe , 850 MeV/u,

$I_0 \sim 3 \times 10^9$ ppspill (1sec extraction)

Standard *FRS*:

S2: SC21, TPC21, TPC22 detectors

S4: MW41, MW42

TPC41, TPC42

MUSIC41, MUSIC42,

SC41, SC42,

Degrader

RISING Ge and active stopper

Study of $N \geq Z$ proton drip-line nuclei $^{96,97,98}\text{Cd}$ with astrophysical consequences

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Year of Approval: 2007 Priority **A**

Shifts: 30+9 approved (main + parasitic)

Remaining Shifts: 15+9 (main + parasitic)

Collaboration

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