34 LOI´s for **AGATA@PreSPEC**

Hans-Jürgen Wollersheim
GSI Helmholtzzentrum für Schwerionenforschung
for the PreSPEC Collaboration

34 LOI´s for **AGATA@PreSPEC**

- **Conceptual design of the AGATA setup at PreSPEC** *(C. Domingo-Pardo)*

  radioactive ion beam RIB intensity: 1000 sec^{-1}
  particle-gamma rate: 0.1 sec^{-1}
  trigger rate: 500 sec^{-1}

- **In-beam background tests at GSI-FRS with an AGATA capsule** *(C. Domingo-Pardo)*

  not relate to neutron damage of AGATA crystals

34 LOI´s for **AGATA@PreSPEC**

- campaign coordinators *(M.Bentley, W.Korten)* and conveners:

1. Nuclear structure effects near N=Z: The neutron-proton degree of freedom and the astrophysical rp-process (G. de Angelis)
2. Shell evolution in light neutron-rich nuclei: N=40 and below (A. Algora)
3. Nuclear structure studies towards ^{78}Ni and the evolution of the N=50 shell closure (G. Duchene)
4. Shape evolution and collective motion in nuclei far from stability (Zs. Podolyak)
5. Nuclear structure studies approaching ^{100}Sn and the heaviest self-conjugate nuclei (B. Cederwall)
6. Structure of nuclei in the astrophysically important region near ^{132}Sn (M. Gorska)

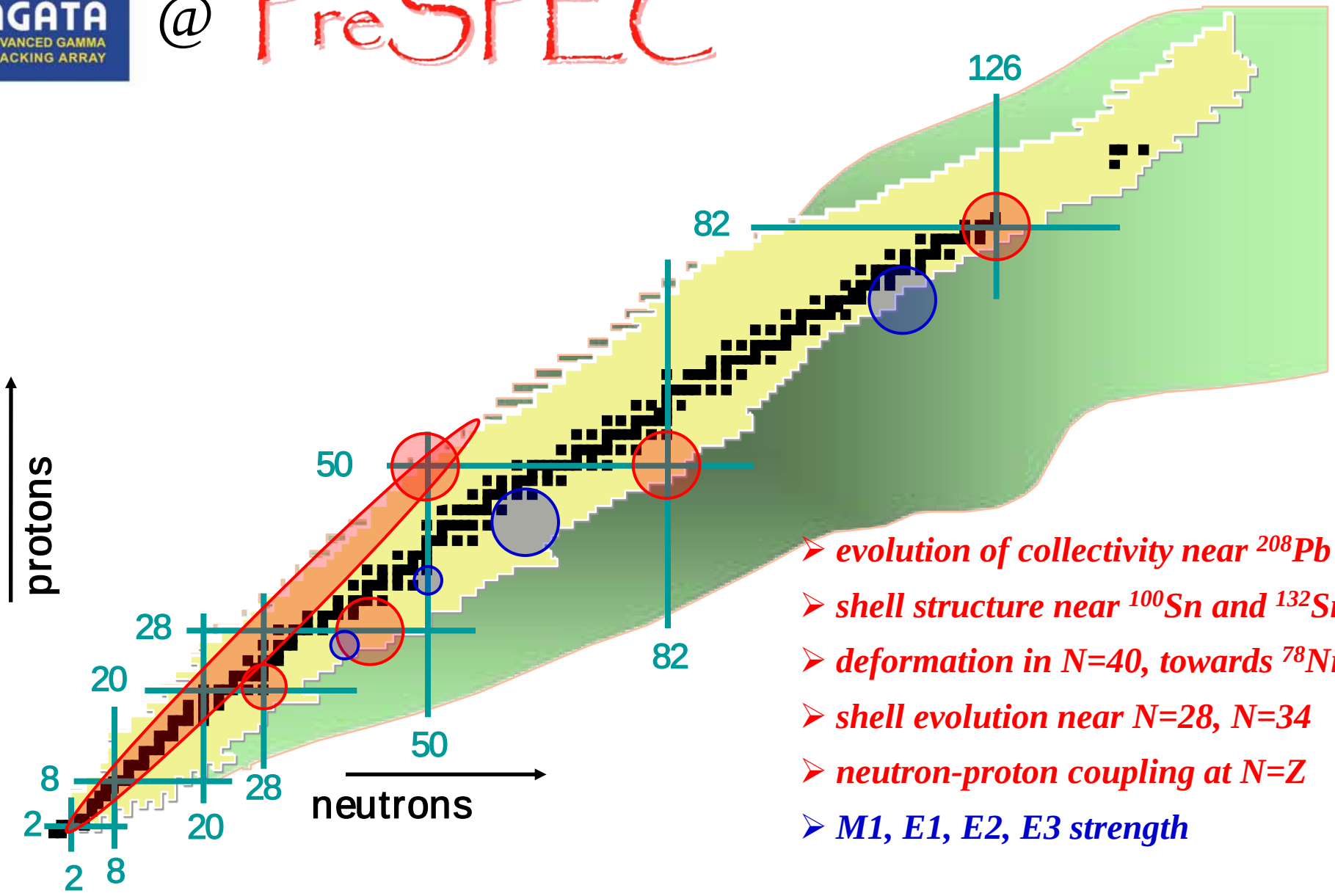
34 LOI´s for **AGATA@PreSPEC**

- technical assessment *by the GSI group*
- 3 LOI meetings *with campaign coordinators and conveners*
  - first submission *of proposals for the G-PAC meeting in* spring 2011
  - second submission *of more complex experiments in* 2012
- AGATA@GSI:
  - start at GSI officially delayed by 6 month *(spring 2012)*
  - FRS training workshop *(November 16-19, 2010; 16 participants)*

FRS-training: *Plamen Boutachkov, Magda Gorska, Chiara Nociforo, Helmut Weick*
http://www-linux.gsi.de/~frsgast/

AGATA
ADVANCED GAMMA TRACKING ARRAY

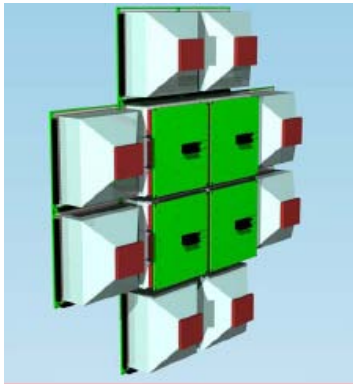
@ PreSPEC

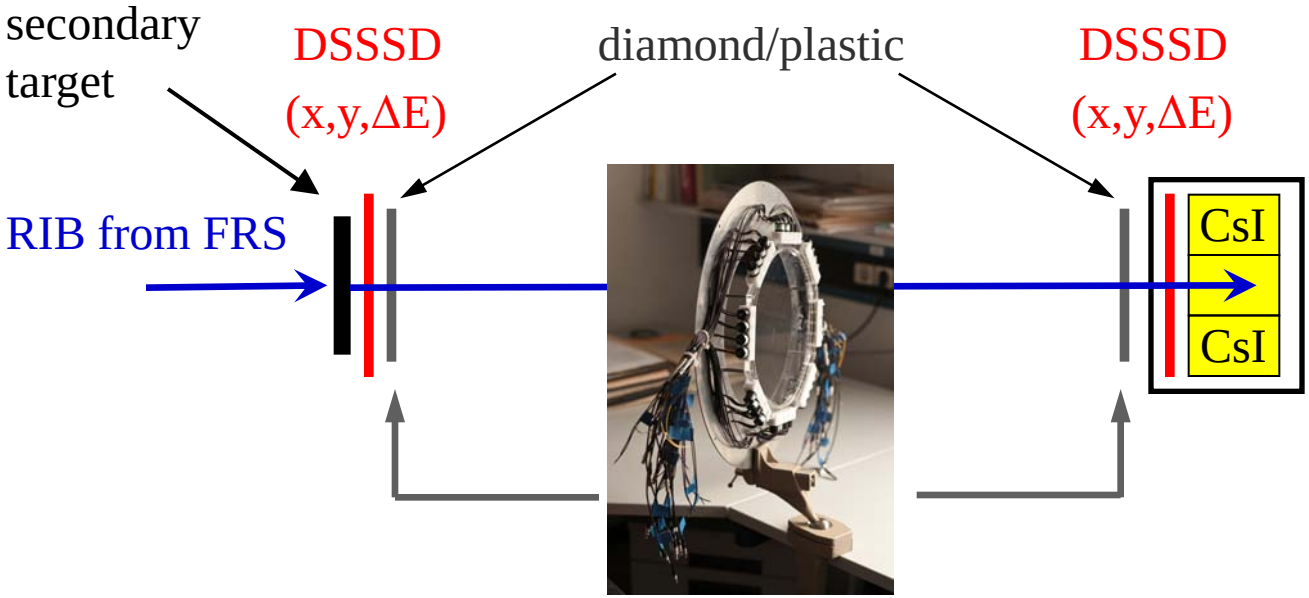


- *evolution of collectivity near ^{208}Pb*
- *shell structure near ^{100}Sn and ^{132}Sn*
- *deformation in N=40, towards ^{78}Ni*
- *shell evolution near N=28, N=34*
- *neutron-proton coupling at N=Z*
- *M1, E1, E2, E3 strength*

PreSPEC

Lund-York-Cologne CAlorimeter (LYCCA)

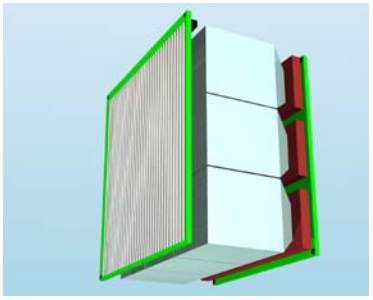


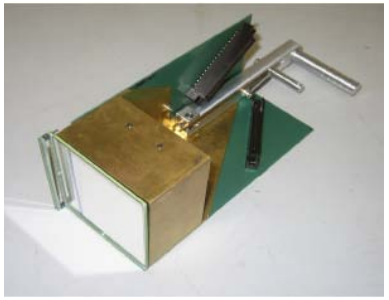


Fragment identification from ΔE, E and TOF

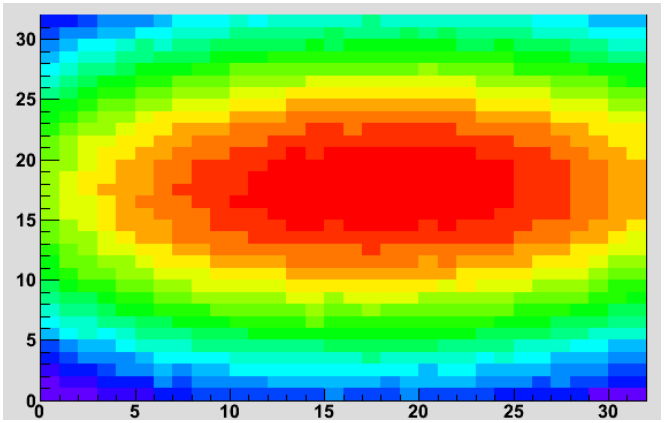
DSSSD's:
60·60·0.3 mm^3, 32 x 32 strips

CsI's:
20·20·11 mm^3, 3 x 3 x 3 array





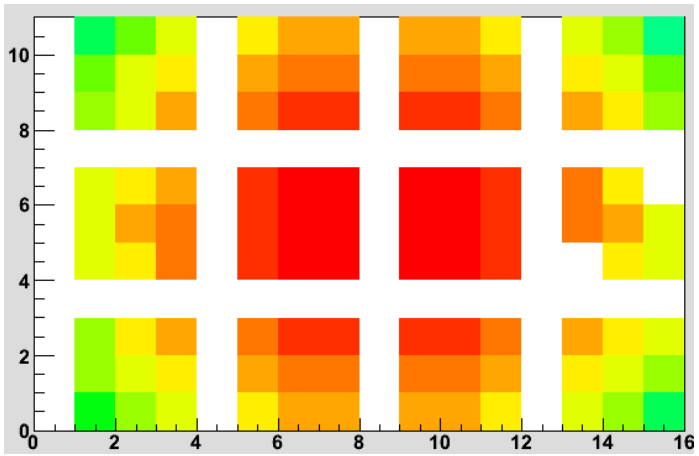
First LYCCA results: hit pattern



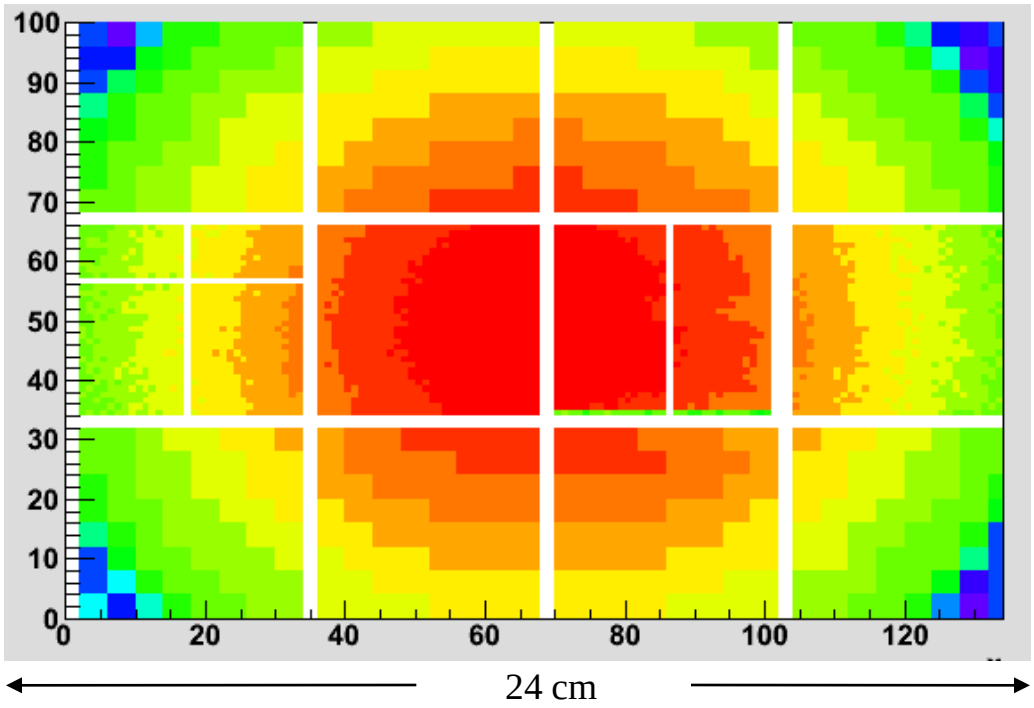
Target

32 of 32 strips working

380 of 384 strips working (~99%)



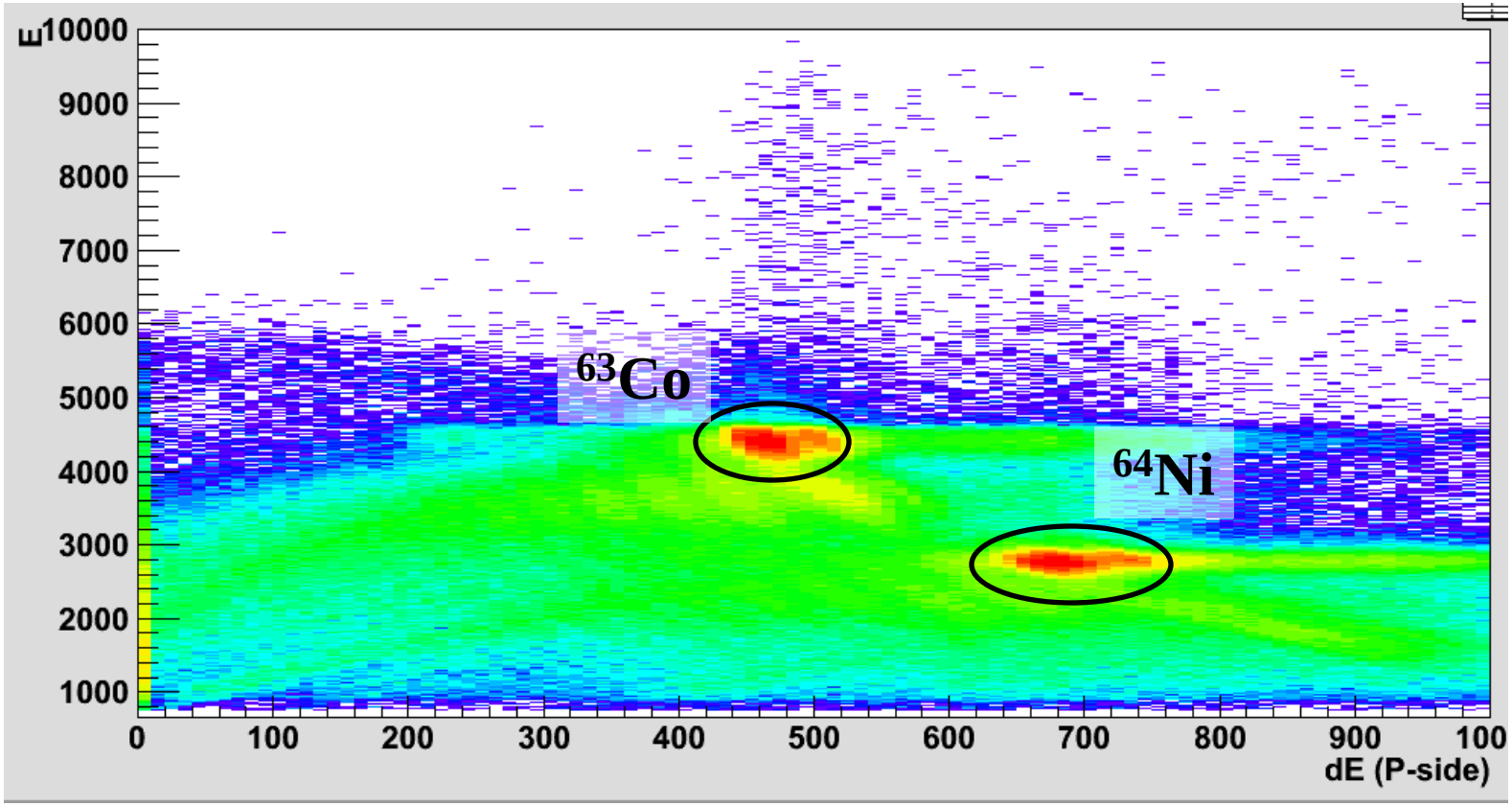
Wall



106 of 108 crystals working (~98%)

Preliminary dE-E

Result obtained with ^{64}Ni and ^{63}Co beam

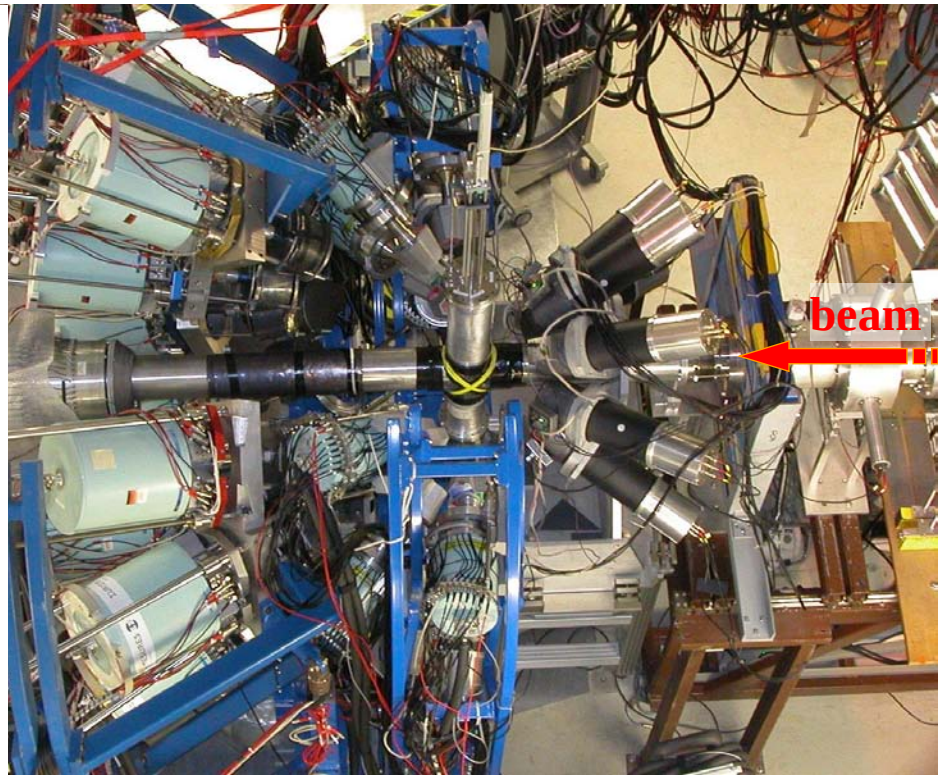


Rare ISotope INvestigation at GSI

EUROBALL Cluster Detectors
Miniball: HPGe segmented detectors

HECTOR
Large 14.5 x 17 cm BaF_2 Detectors

CATE : ΔE-E telescope
event by event beam identification



Coulomb Excitation at Relativistic Energy

- ✓ **New Shell structure at N>>Z**
- ✓ **Relativistic Coulomb excitation of nuclei near ^{100}Sn**
- ✓ **Triaxiality in even-even core nuclei of N=75 isotones**
- ✓ **E1 Collectivity in neutron rich nuclei ^{68}Ni**

nucleus	*σ (mb)*
^{56}Cr	91
^{108}Sn	314
^{136}Nd	338 / 2180

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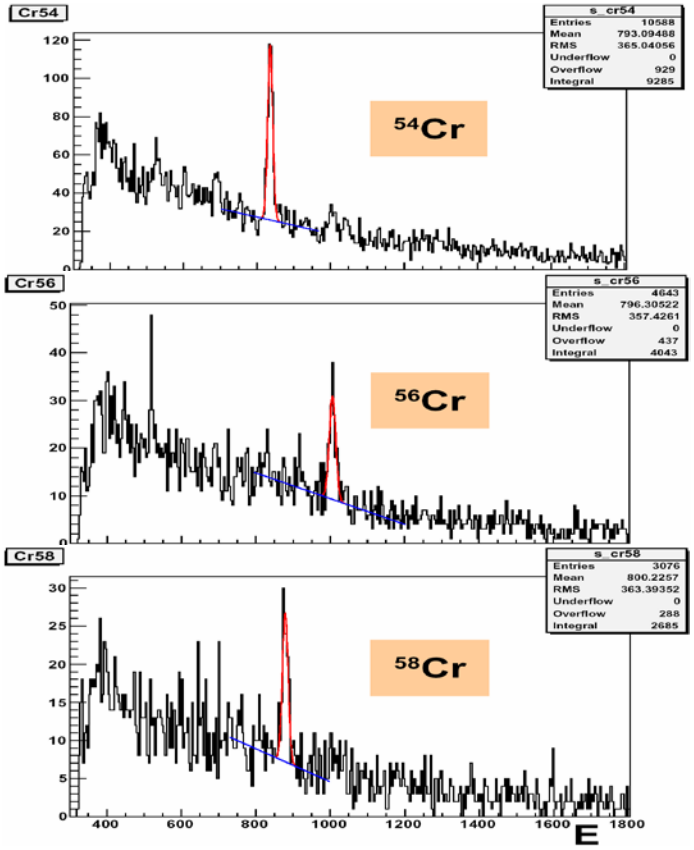

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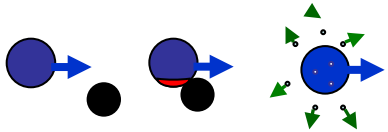
LOI´s for AGATA@PreSPEC

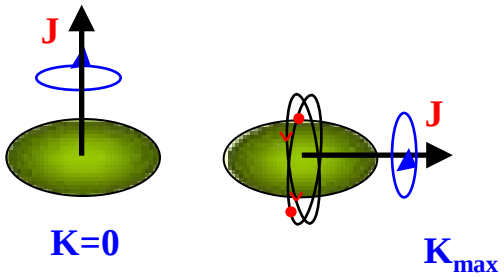
Production of isomeric beams:



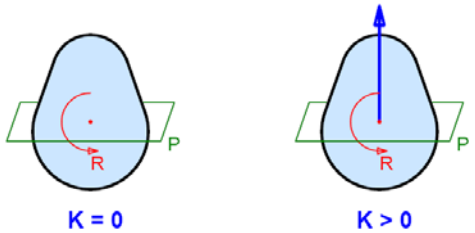
abrasion ablation

$$\frac{I_{isomer}}{I_{gs}} \approx 20\%$$

Symmetries of the Intrinsic Hamiltonian:



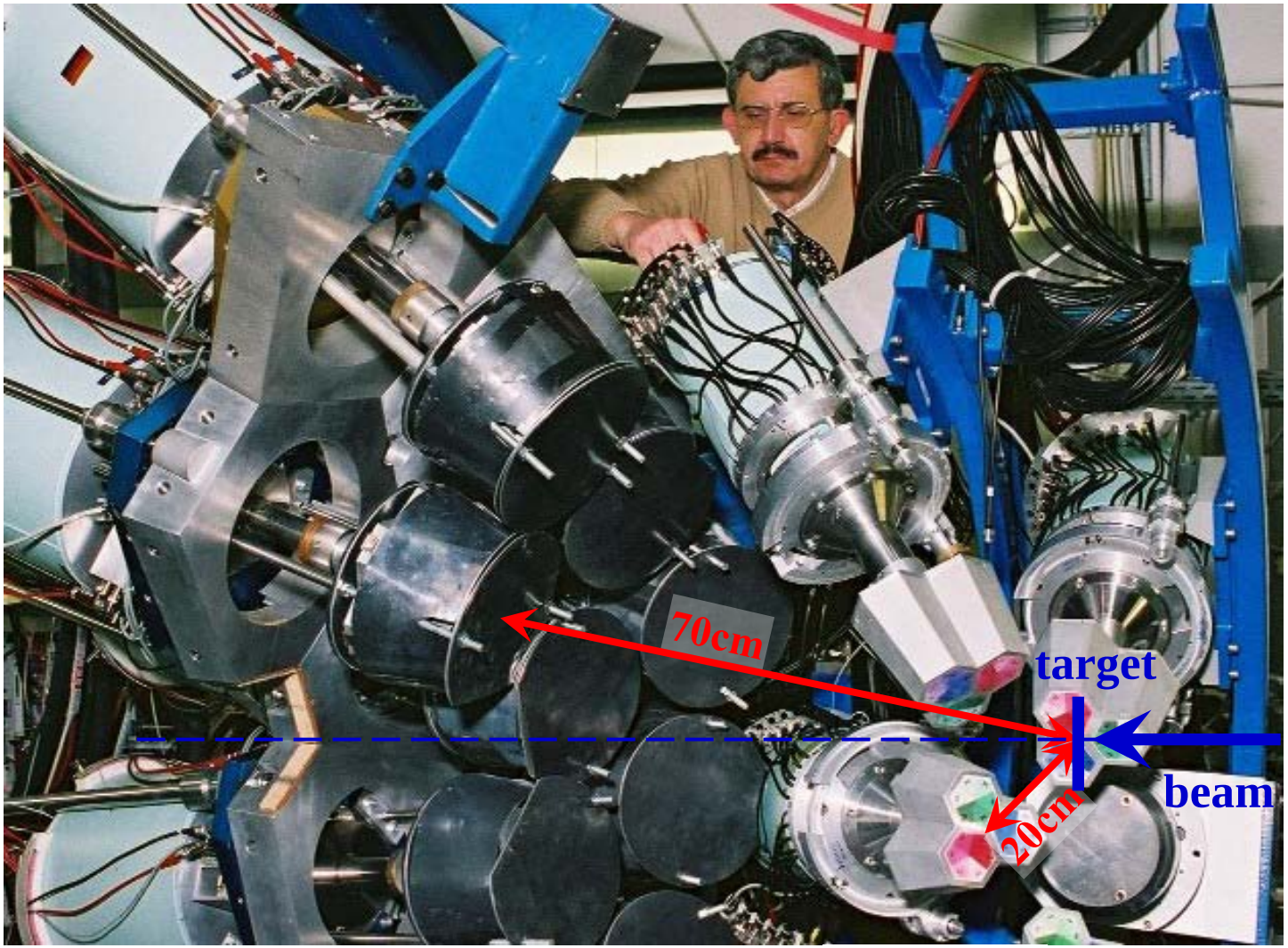
❖ axial symmetry, reflection-symmetry
RIB intensity: 20%

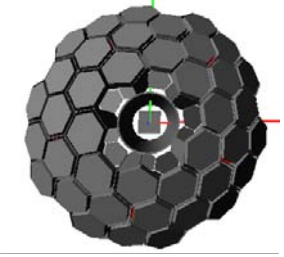


❖ axial symmetry, reflection-asymmetry
E3/E2 cross section: 10%

❖ M1 Coulomb excitation
M1/E2 cross section: 1%

γ-ray setup with higher efficiency





More complex PreSPEC experiments

- **AGATA Physics Workshop 2010 (AGATA@GSI)**
  4-7 May 2010 Istanbul, TURKEY
  - *34 LOI´s for fast-beam campaign*

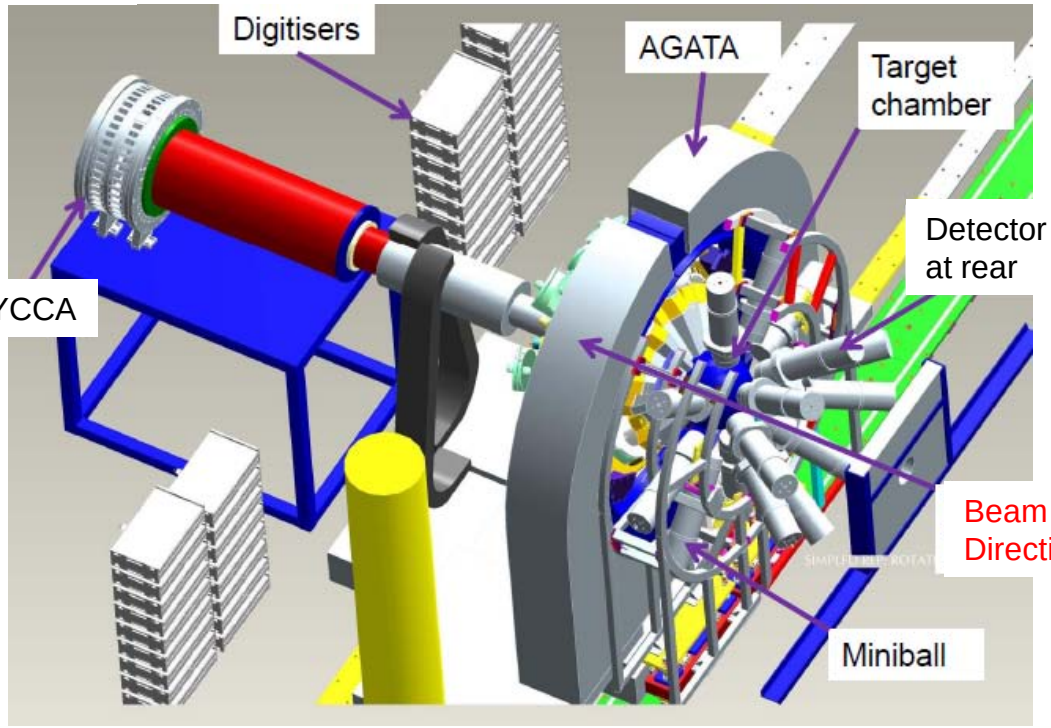
- **Prespec commissioning 2011**

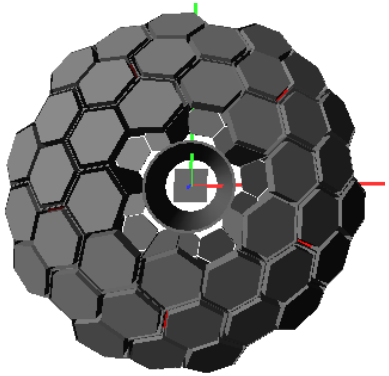
- **Relativistic Coulomb excitation**
  - *lifetimes (DSAM, RDDS)*
  - *g-factor (high-velocity transient field technique)*

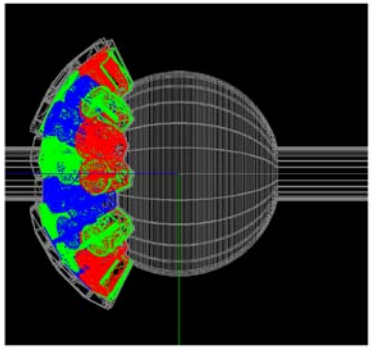
- **Fragmentation reactions**
  - *lifetimes (DSAM, RDDS)*

- **Proton scattering** (LH_2 target)
  - *spectroscopic factors*

PreSPEC and AGATA







γ-efficiency = 17.5%
γγ-efficiency = 2.5%

resolution (FWHM)	intrinsic spatial resolution
8.5 keV	5 mm
4 keV	2 mm

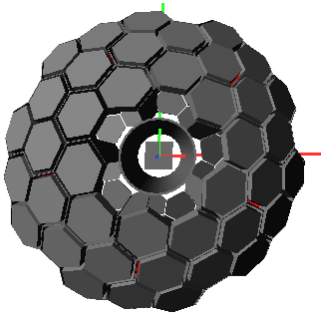
Aim for AGATA@GSI:

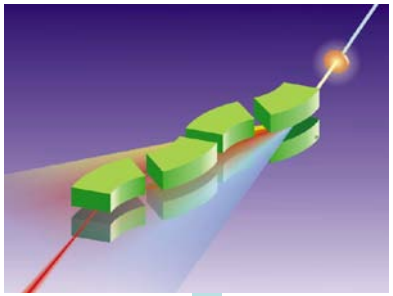
- **5 double Cluster**
  10 triple Cluster
- **AGATA + Miniball**

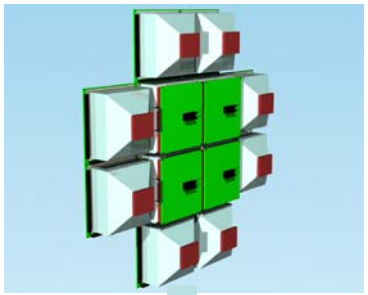
start spring 2012

John Strachan

Data Acquisition and Run Control







raw data

- γ-ray tracking
- Doppler-shift
- HI-tracking
- reaction selection

Z,A
before target

Z,A
after target

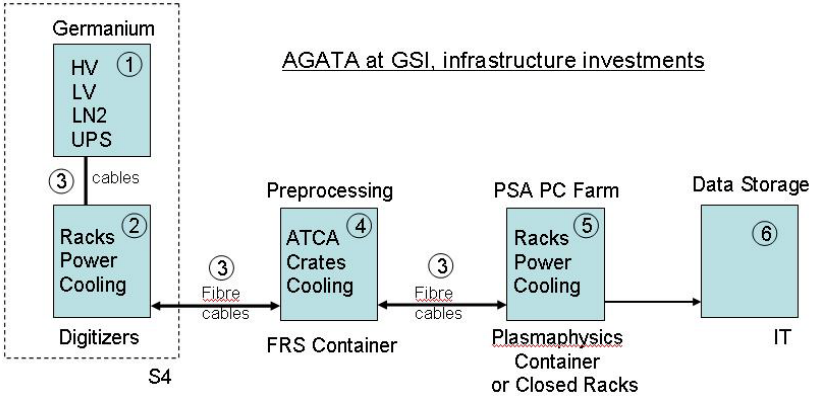
data analysis with Cracow (J. Grebosz)

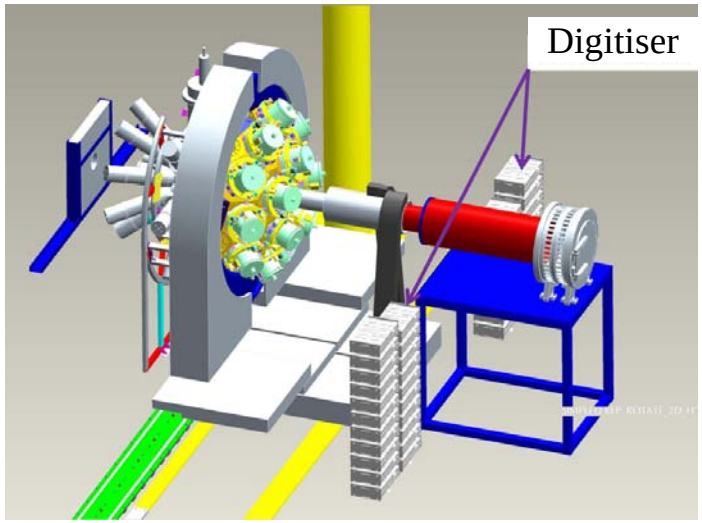
AGATA
ADVANCED GAMMA TRACKING ARRAY

run control

PreSPEC

AGATA@GSI infrastructure investments





zu 1)
- iseg HV Eurocrate: ……..… 3010,-
- iseg 8 ch HV Modul (5 Stück): …… 13500,-
- Datatec LV Modul (5 Stück): …….. 30000,-
- UPS 40kVA …… 20000,-

zu 2)
- 21“ Rittal Racks (5 Stück): ……...…… 4300,-
- Wasserkühlung Installation: …… 5000,-
- Elektroinstallation:

zu 3)
- Kupferkabel, HV, LV, MDR ……... 30000,-
- 280 x MPO-MPO Kabel (12adrig): ……. 80000,-
- 320 x LC-LC Kabel: ……. 11200,-
- LC Kabel für GTS Tree:

zu 4)
- Wasserkühlung ?

zu 5)
Variante a) Container Plasmaphysik
- Trennwand einziehen
- Racks/Elektroinstallation
- Klimaanlage ……. 15000,-

Variante b) geschlossene Racks
- Rittal Racks mit Wasserkühlung …….. 27200,-
- Elektro-/Wasserinstallation

zu 6)
- Kosten pro TerraByte: ……. xxx,- ???