



**Nuclear Structure Studies
Prospects within LIBRA**

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Outline

- ◆ Research Experience
- ◆ Personalizing LIBRA
- ◆ Nuclear Structure in LIBRA:
What, Where, How
- ◆ Deliverables: Hopes & Expectations

A little Background

- ◆ Ph.D. '02, Rutgers University
(Prof. N. Benczer-Koller)



- ◆ Stable-beam experiments @ Yale, Berkeley

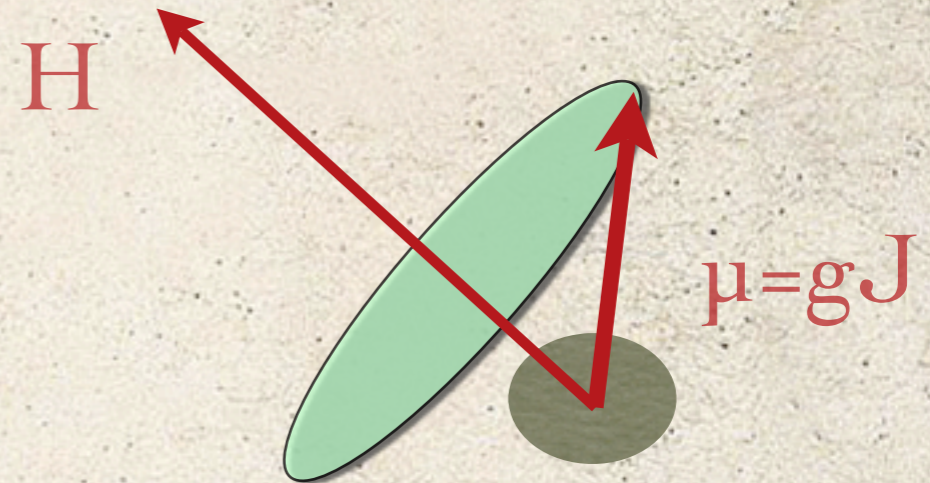
- ◆ NSCL: Nuclear Structure w/ RIB



Scientific Directions

- ◆ Main Research Interests:

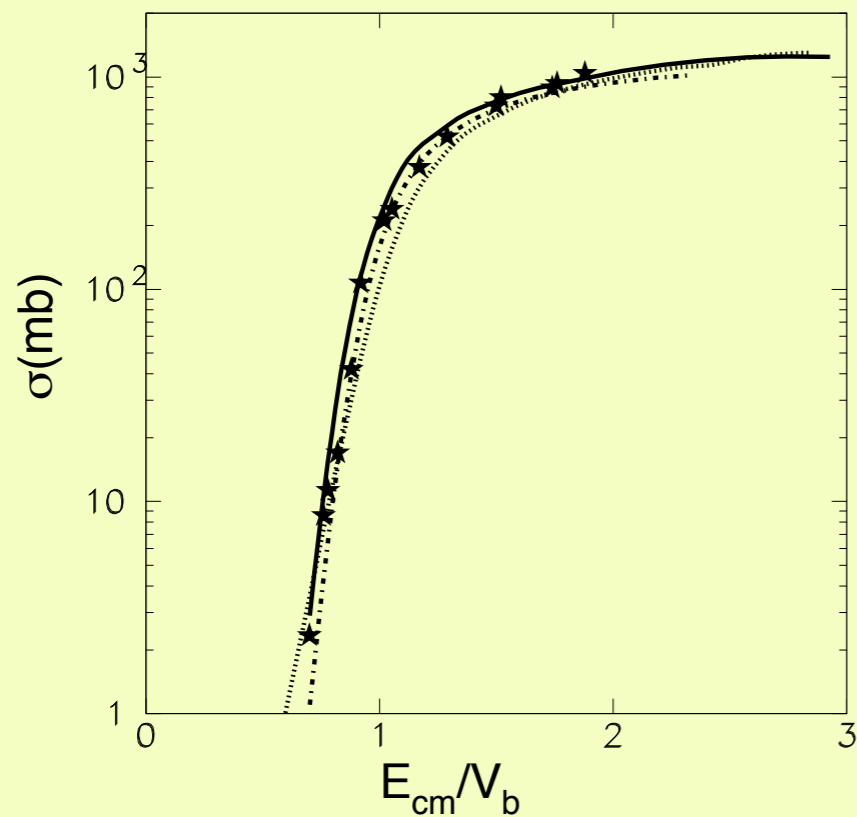
EM moments



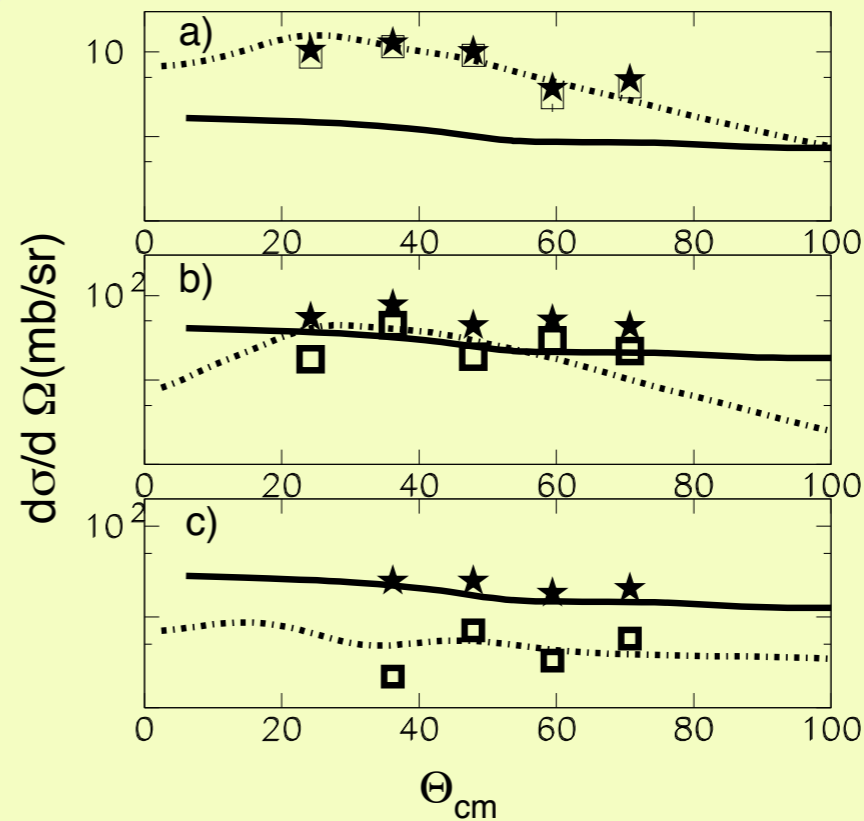
- ◆ Recent Experiments @ GANIL w/ People from Leuven, Sofia, Saclay etc.
- ◆ Univ. of Ioannina: Focus on low-energy nuclear reactions @ Demokritos TANDEM lab

Scientific Directions

- ◆ Univ. of Ioannina: Focus on low-energy nuclear reactions @ Demokritos TANDDEM lab



fusion σ_{exp} (together with theory)



angular correlations

LIBRA

- ◆ Low-energy Ion Beam Research & Applications
- ◆ Tandem Lab @ Demokritos: field of action
- ◆ ∃ Six main objectives (Multipurpose)
- ◆ Great ambitions / Unique opportunity

The Objectives

- ◆ Recruitment of young highly-qualified researchers and technical personnel.
- ◆ Mobility of researchers (trans-national two-way secondments).
- ◆ Development and/or acquisition of advanced scientific tools.
- ◆ Upgrade of certain accelerator components.
- ◆ Organization of scientific events.
- ◆ Dissemination and promotional activities

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Personalizing LIBRA

- ◆ Assist in the installation of the 4π calorimeter
- ◆ Help to upgrade beam lines
- ◆ Participate in the plunger construction
- ◆ Miscellaneous Equipment Development
- ◆ Educate / Get educated

Scientific- 1

- ◆ Invest on activities enhancing the stable-beam presence in Greece and the Balkan region
- ◆ Measurements of lifetimes w/ the plunger
- ◆ 4π detectors: Cross sections for p-nuclei
- ◆ Spectroscopy and Nuclear Astrophysics

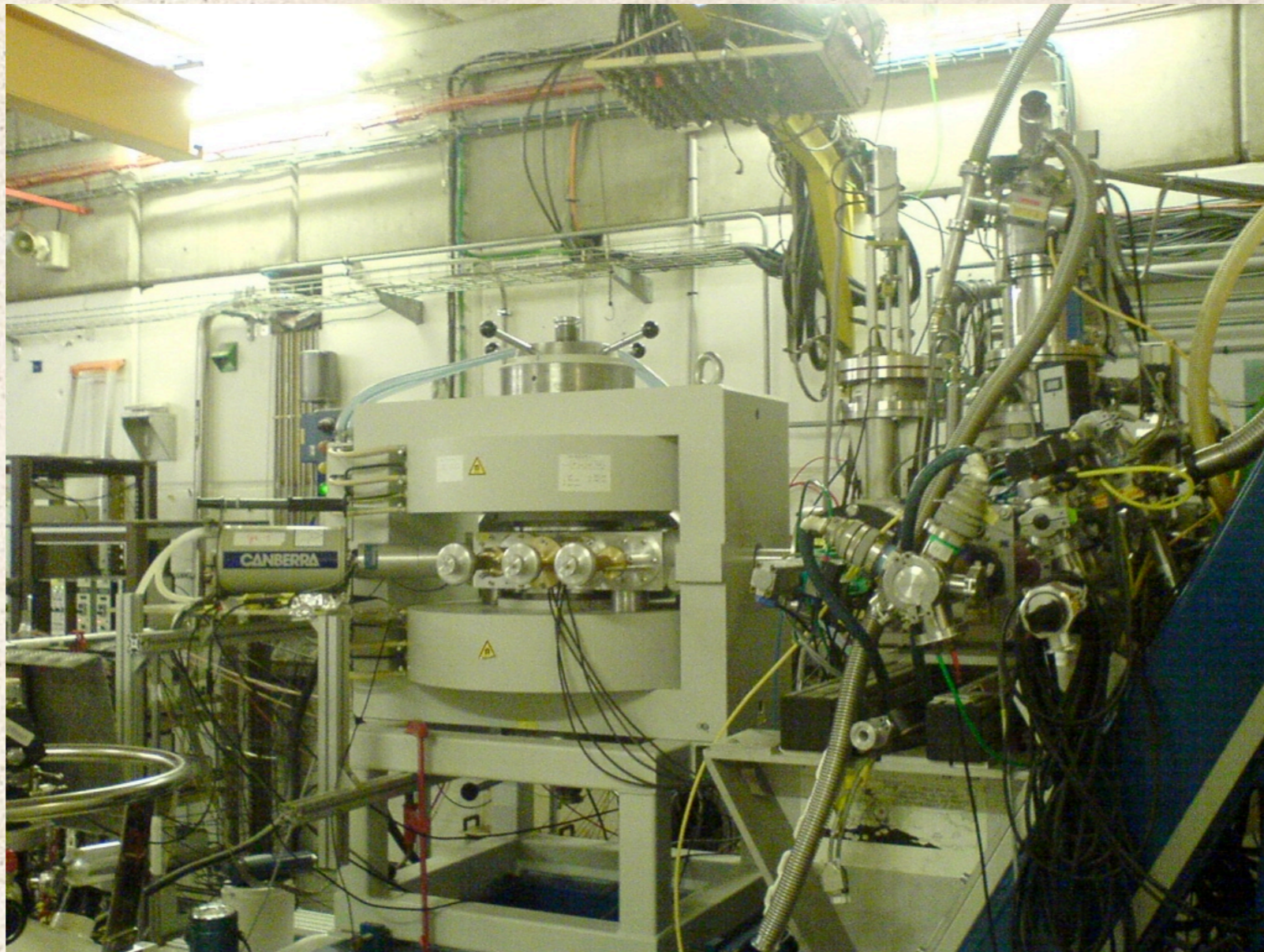
Scientific- II

- ◆ Open projects will be continued, future projects will be pursued
 - ❖ @ GANIL
 - ❖ @ FAIR
 - ❖ @ NSCL
 - ❖ @ REX-ISOLDE

GANIL-1

- ◆ Open projects include β -NMR experiments exploring the limits of the 'island of inversion'
- ◆ Preliminary results include Al, Cl isotopes g.s. magnetic moments
- ◆ NSCL-developed HVTF technique has been applied recently in GANIL

GANIL setup



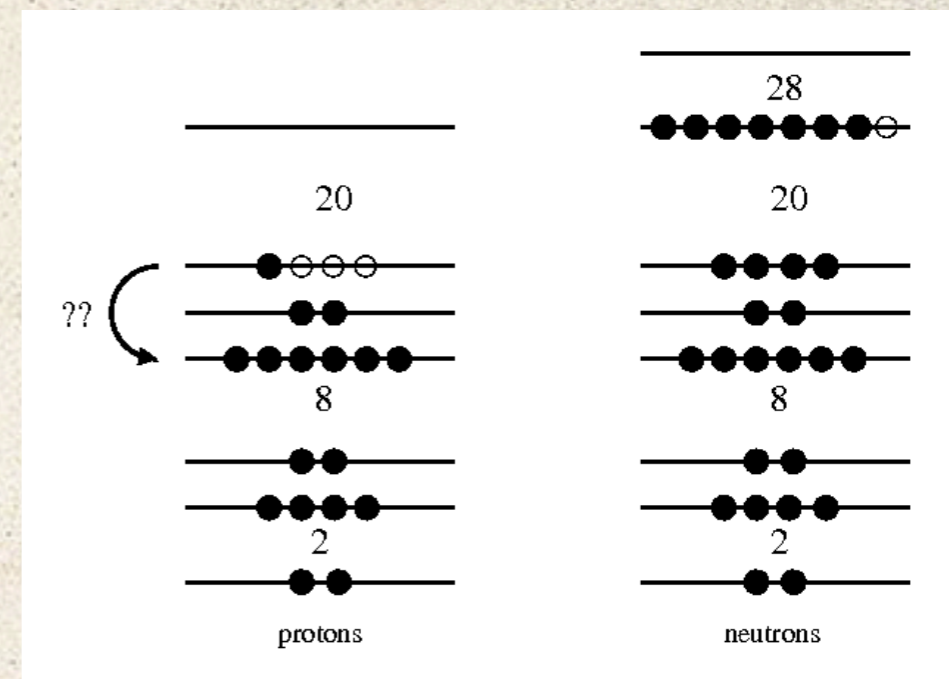
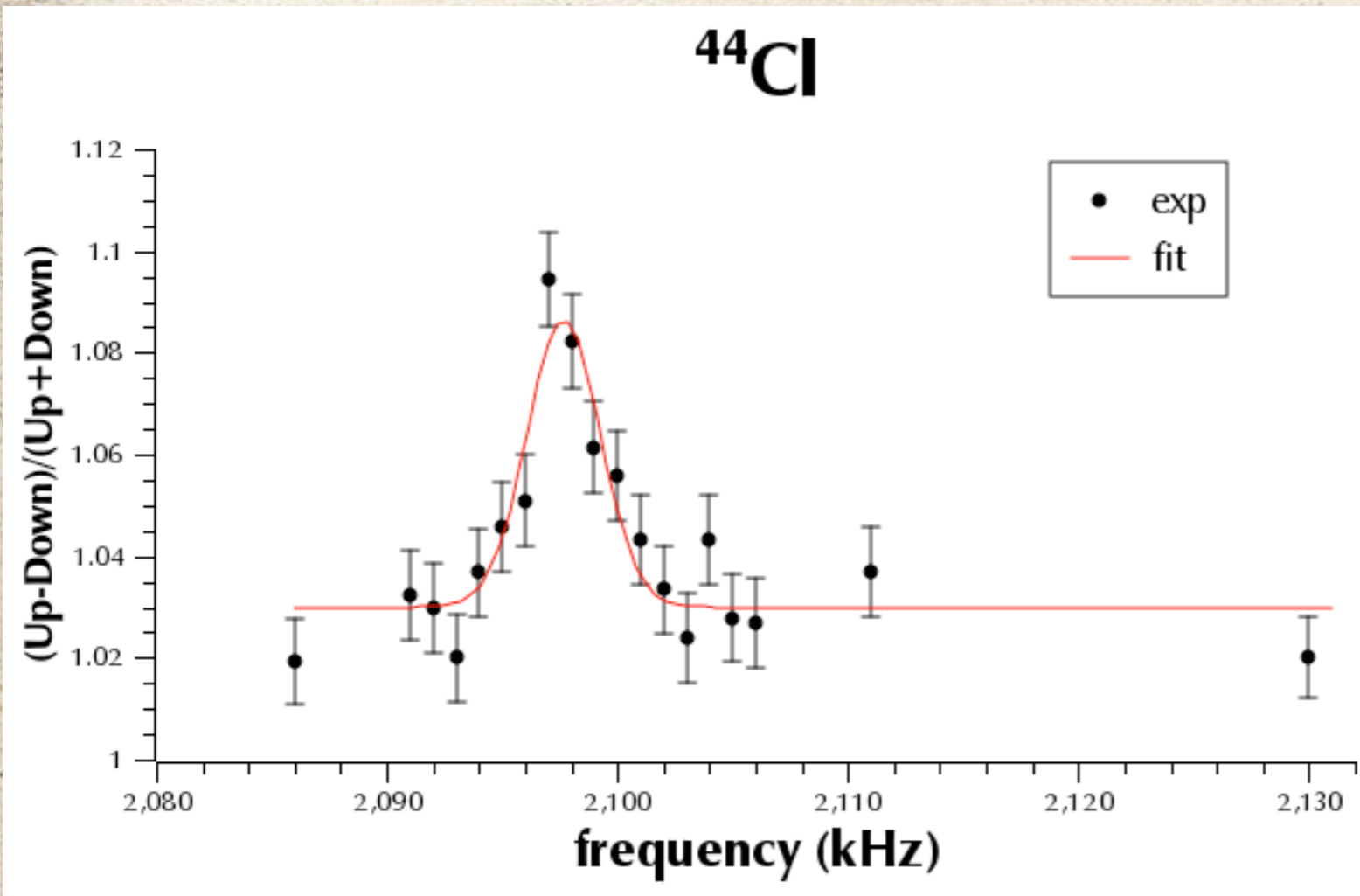
THEO J. MERTZIMEKIS/LIBRA KICKOFF MEETING/11-03-2009



A recent study case

PRELIMINARY

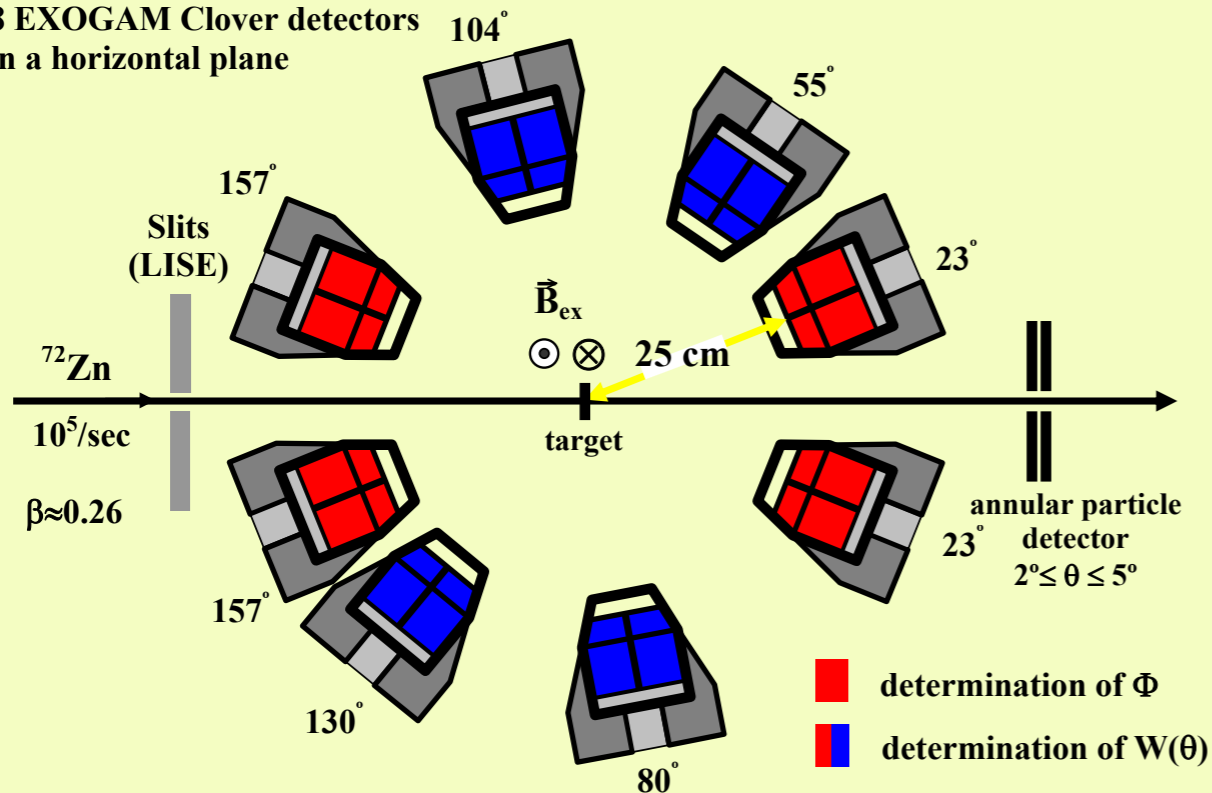
$$|g| = 0.27498(8)$$



Thesis: Marieke DeRydt, Leuven

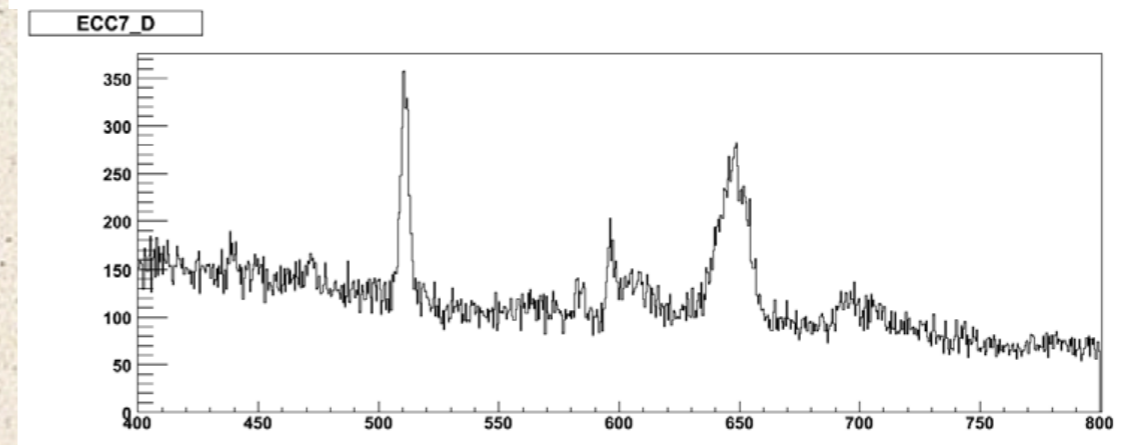
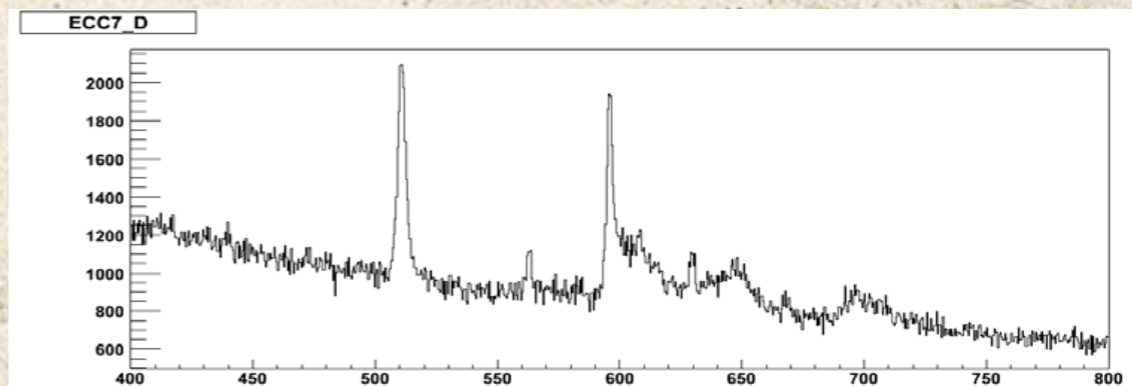
Another recent case

8 EXOGAM Clover detectors
in a horizontal plane



$^{72}\text{Zn } 2^+$ g factor

HVTF technique (NSCL-developed)



Thesis: Enrico Fiori, Camerino
work under progress, project includes ^{74}Zn

GANIL-II

- ◆ Future proposals (next deadline in 2 wk !!)
targets β -decaying isomeric states in n -rich
Co isotopes.
- ◆ Many structure questions in this region
e.g. Are the observed isomeric states
intruder states?

gPRESPEC (aka gRISING-II)

- ◆ Lols focus on in-beam magnetic-moment measurements of isomeric states
- ◆ Explore low-lying structures of rare isotopes, taking advantage of unique FAIR capabilities especially around $N=Z$ line
- ◆ Enhance Demokritos' presence in cutting-edge facilities and active EU collaborations

Wrapping Up

- ◆ LIBRA provides a unique opportunity for:
 - ❖ Establishing a cutting-edge program in nuclear structure studies **here** and **elsewhere**
 - ❖ Investing on the Greek young scientist potential
 - ❖ Expanding the technical and scientific capabilities of the TANDEM lab

LIBRA: A 3-fold benefit

- ❖ **Personal:** work on international collaborations, get involved in modern, open questions of Nuclear Physics
- ❖ **Institutional:** Elevate the nuclear structure program.
- ❖ **International:** invest on Greek scientific potential and infrastructure.

YEAR
2009
HOROSCOPES

★ LIBRA



Brilliant ideas come easily into Libra's awareness throughout 2009. As you trust your higher self and allow thoughts to flow freely, you are able to embrace new opportunities and make positive changes in your life. You come to a higher level of understanding and appreciation as you let go of old ideas. You're no longer separated from what you want as you to detach from limiting thoughts, bringing you a new spiritual perspective of feeling fully supported and loved.

THANKS !!!

