

In-Beam Spectroscopy at Cave X8?

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on behalf of the AGATA-PRESPEC Collaboration

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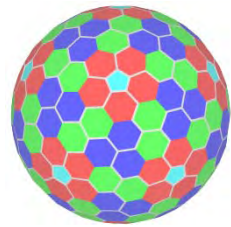


This is a **PROPOSAL(!)**
for
IN-BEAM (SHE) SPECTROSCOPY
with
TASCA and within **AGATA-PRESPEC**

- **Background**
- **Suggestion**



The AGATA Collaboration



Memorandum of Understanding 2003-08: R&D phase

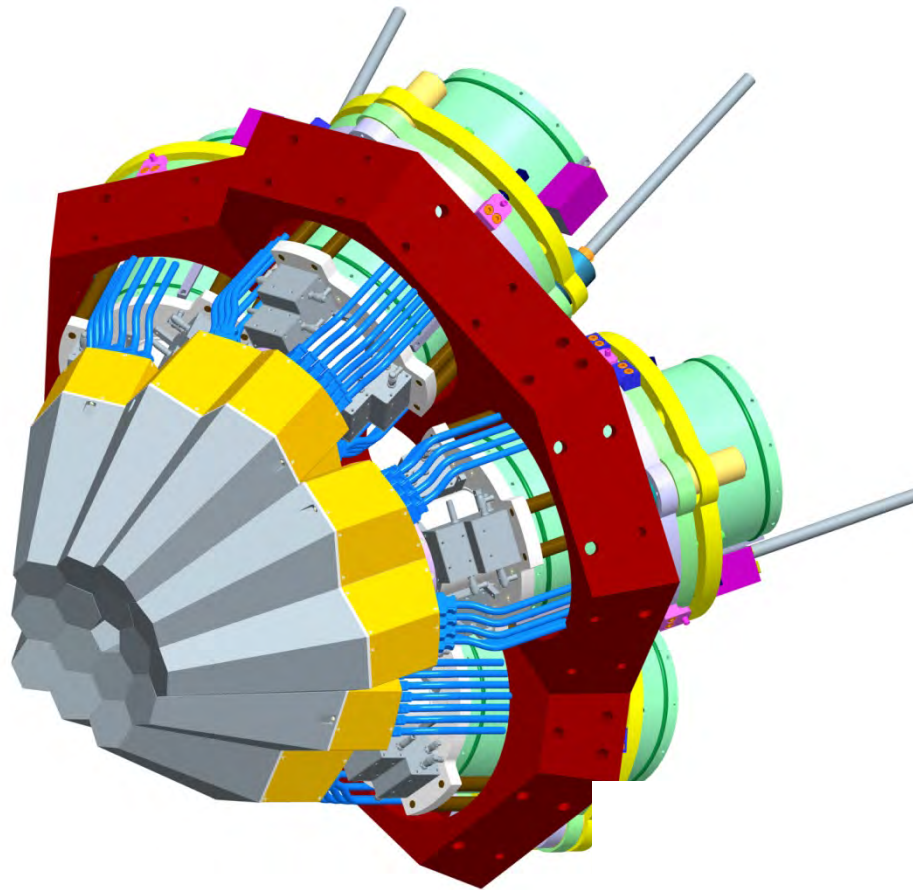


Bulgaria:	Univ. Sofia	12 Countries >40 Institutions
Denmark:	NBI Copenhagen	
Finland:	Univ. Jyväskylä	
France:	GANIL Caen, IPN Lyon, CSNSM Orsay, IPN Orsay, CEA-DSM-DAPNIA Saclay, IPHC Strasbourg	
Germany:	HMI Berlin, Univ. Bonn, GSI Darmstadt, TU Darmstadt, FZ Jülich, Univ. zu Köln, LMU München, TU München	
Hungary:	ATOMKI Debrecen	
Italy:	INFN-LNL, INFN and Univ. Padova, Milano, Firenze, Genova, Napoli,	
Poland:	NINP and IFJ Krakow, SINS Swierk, HIL & IEP Warsaw	
Romania:	NIPNE & PU Bucharest	
Sweden:	Chalmers Göteborg, Lund Univ., KTH Stockholm, Uppsala Univ.	
Turkey:	Univ. Ankara, Univ. Istanbul	
UK:	Univ. Brighton, CLRC Daresbury, Univ. Keele, Univ. Liverpool, Univ. Manchester, Univ. Paisley, Univ. Surrey, Univ. York	



Advanced GAMMA-ray Tracking Array AGATA Demonstrator

Objective of R&D phase 2003-2008



1 symmetric triple-cluster

5 asymmetric triple-clusters

36-fold segmented crystals

540 segments

555 digital-channels

Efficiency $\sim 5\%$ @ $M_\gamma = 1$

Efficiency $\sim 3\%$ @ $M_\gamma = 30$

Full **EDAQ** with PSA and tracking

2009: In beam commissioning LNL

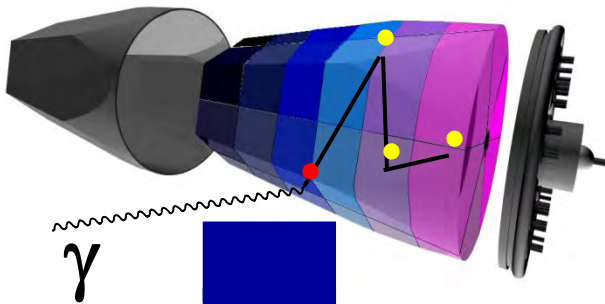
2010: Experiments at LNL

Cost ~ 6 M€ capital

Concept of Gamma-ray Tracking



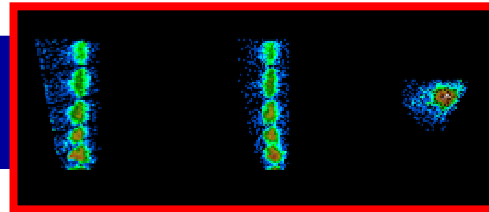
Highly segmented
HPGe detectors
and novel preamps



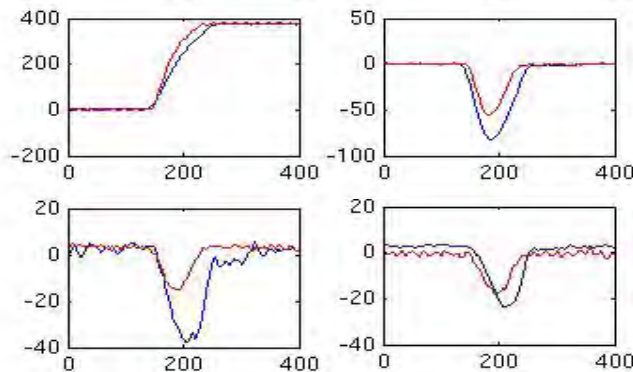
Synchronized digital
electronics
record and process
the segment signals
**DIGITIZERS +
PRE-PROCESSING**

Identified
interaction points

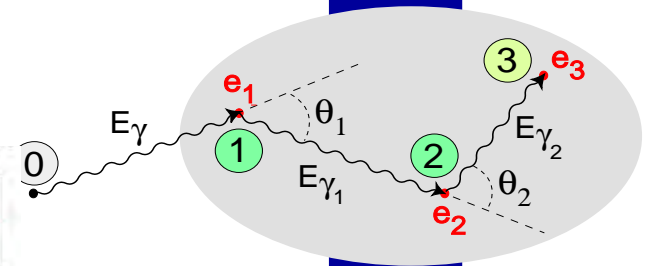
$$(x, y, z, E, t)_i$$



Pulse Shape Analysis
to deconvolute the
recorded waves
DAQ PSA - FARM



Reconstruction of
interaction tracks
(tracking algorithms
on interaction points)
DAQ TRACKING-FARM



**On-line reconstruction
of γ -rays**

Nuclear structure at GSI by means of γ -ray spectroscopy:

Excerpt from the Memorandum of Understanding:

"PRESPEC is a collaborative European project ... to construct and operate detector set-ups at the SIS/FRS facility at GSI for nuclear spectroscopy. It builds upon the successful RISING project and will employ equipment that was used in RISING as long as is appropriate. It is also aimed at preparing for the spectroscopy to be carried out with HISPEC/DESPEC at NUSTAR/FAIR by commissioning and employing components developed for HISPEC/DESPEC already at the SIS/FRS facility. It is also intended that AGATA detectors will be used at the SIS/FRS facility as part of PRESPEC."



PreSPEC Fast Beam Campaign

provisional time plan!!!

	2010				2011				2012				2013			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Beamtime UNILAC	Green		Green		Green	Green		Green	Green	Green	Green	Green	Green	Green	Green	
Beamtime SIS	Green		Green		Green	Green		Green	Green			Green	Green	Green	Green	
Beamtime ESR	Green		Green		Green	Green		Green	Green			Green	Green	Green	Green	
Shut-Down UNILAC		Red		Red			Red									Red
Shut-Down SIS				Red			Red			Red	Red					Red
PreSPEC Commissioning	Blue		Cyan													
2 weeks PreSPEC front-up			Blue		Cyan											
12 weeks PreSPEC-AGATA								Blue	Blue			Blue	Cyan			

About 10 AGATA triples (twice the AGATA-Demonstrator!) and associated infrastructure will be at GSI 2011–2013.

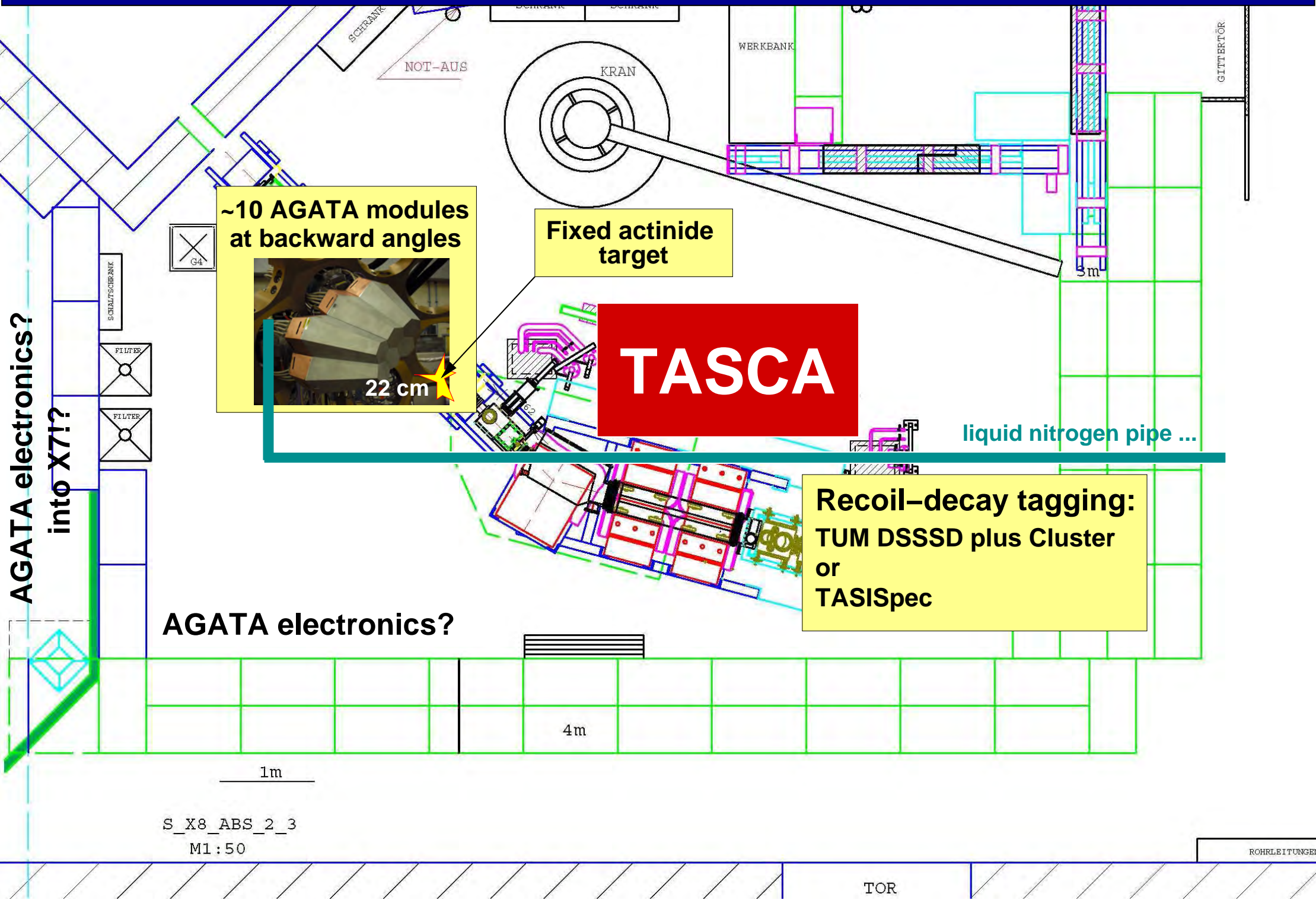
SIS-FRS beamtime: 12 weeks (out of more than 80)!

Additional use at GSI – UNILAC experiments

Potentially UNIQUE use via coupling to TASCA!

Installation Spring 2012, experiments Summer 2012.

Spectroscopy of n-rich SHE



... would simply need to be started as soon as possible.

It IS (or would be) a major operation ...
... but provides unique opportunities.