

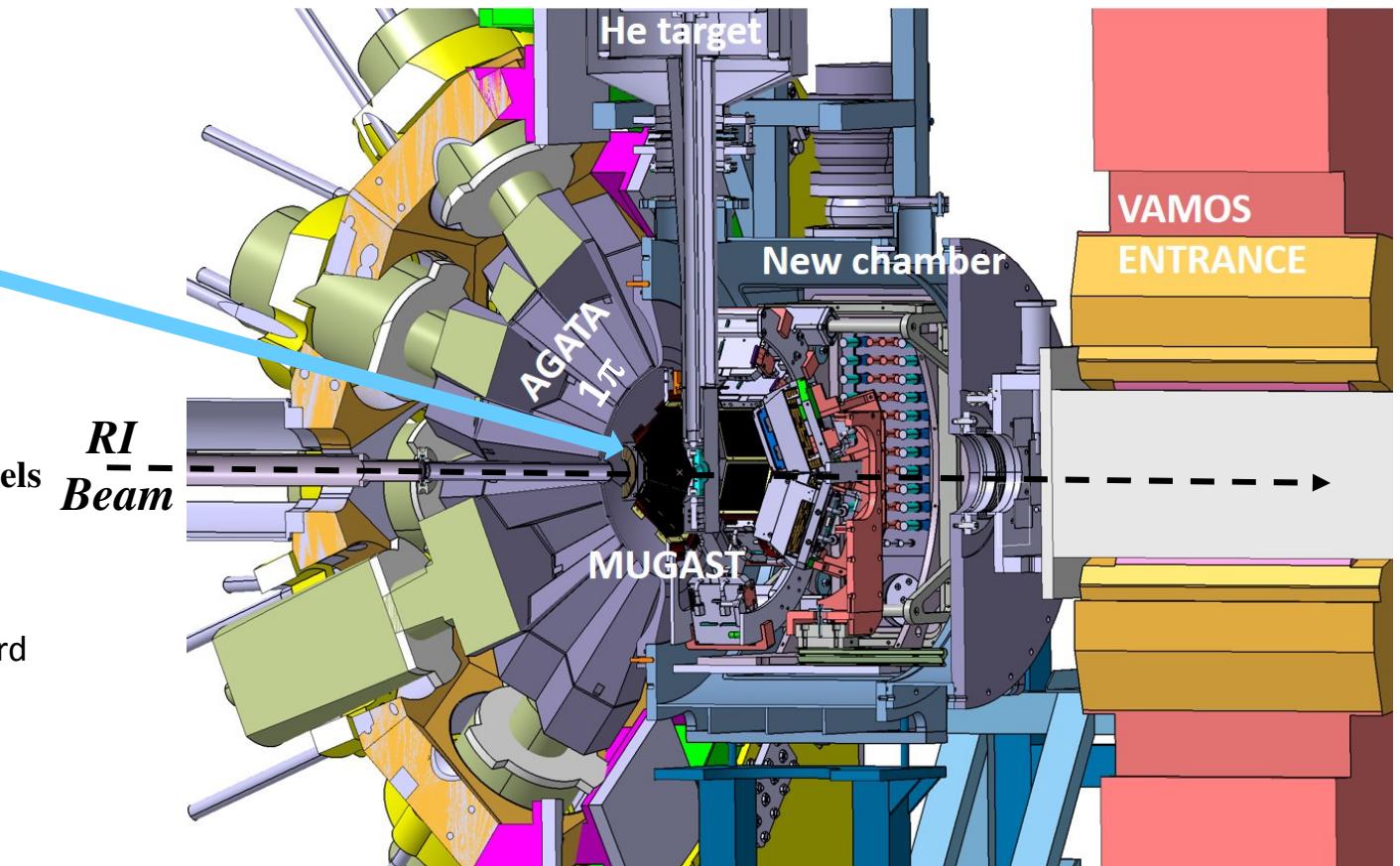
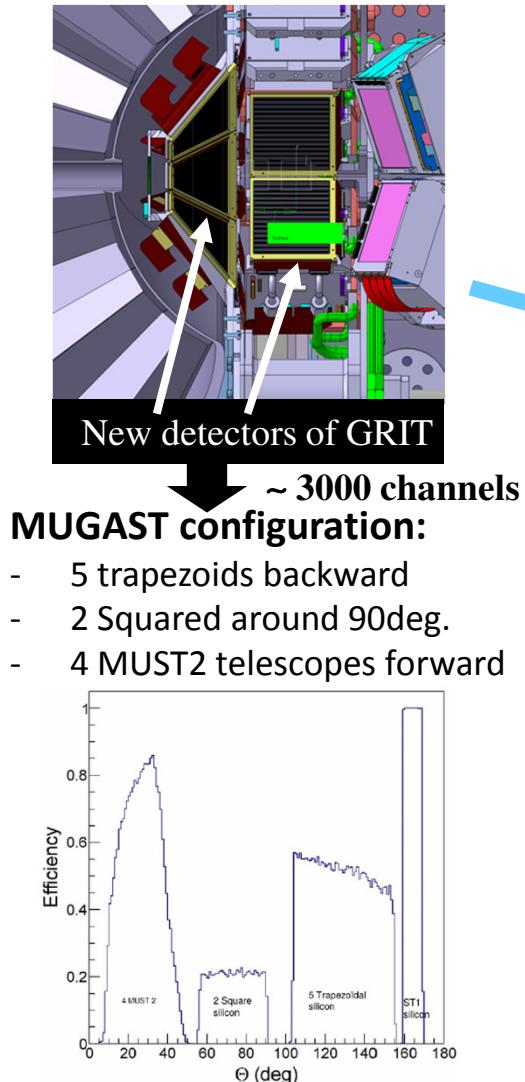
MUGAST – EXOGAM @ LISE

D.Beaumel, IPN Orsay

MUGAST: an intermediate step towards GRIT

- MUGAST:**
- New detectors of *GRIT* + *MUST2* electronics + few telescopes
 - Coupled with *AGATA* @ VAMOS

⇒ *First High resolution Direct Reactions studies at Ganil (SPIRAL1 beams)*



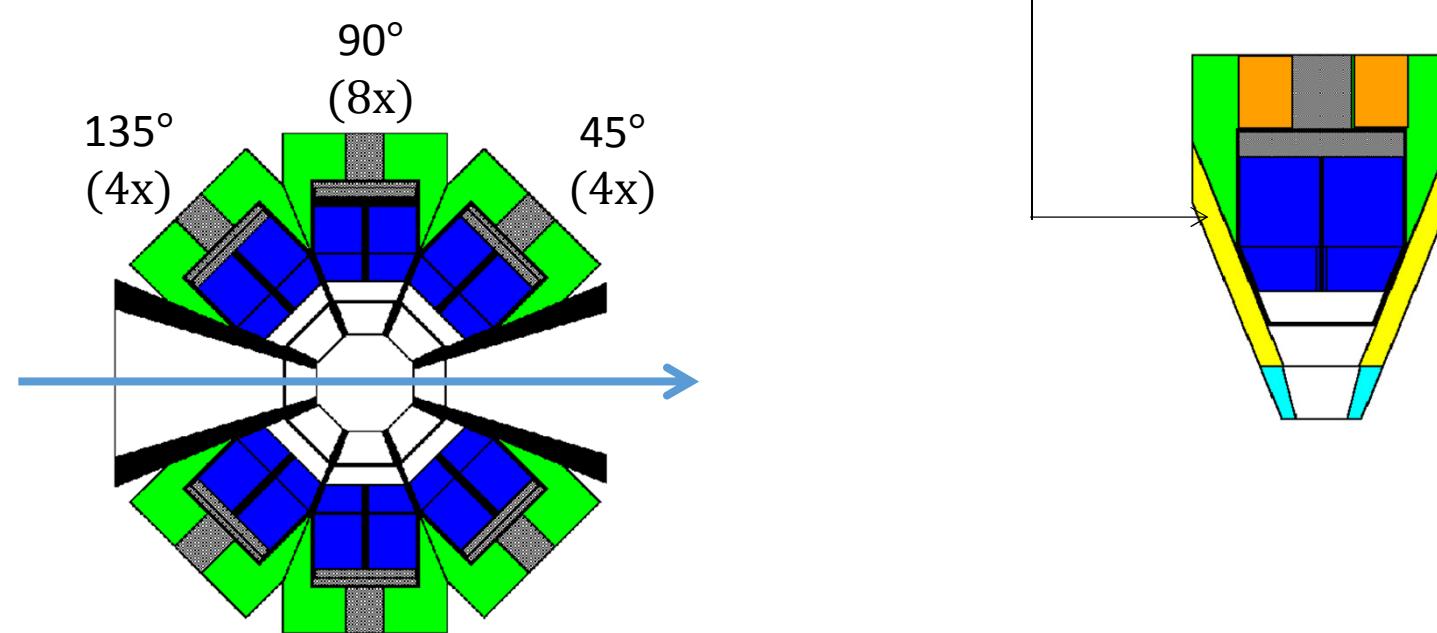
Efficiency for 1π AGATA : ~10% at 1 MeV

Funding: In2p3+P2iO, Surrey, INFN,
GANIL, Santiago

First Campaign in 2019
Coordinator: M. Assié, IPNO

EXOGAM

2 configurations with 16 detectors : with(B) or w/o(A) side shield



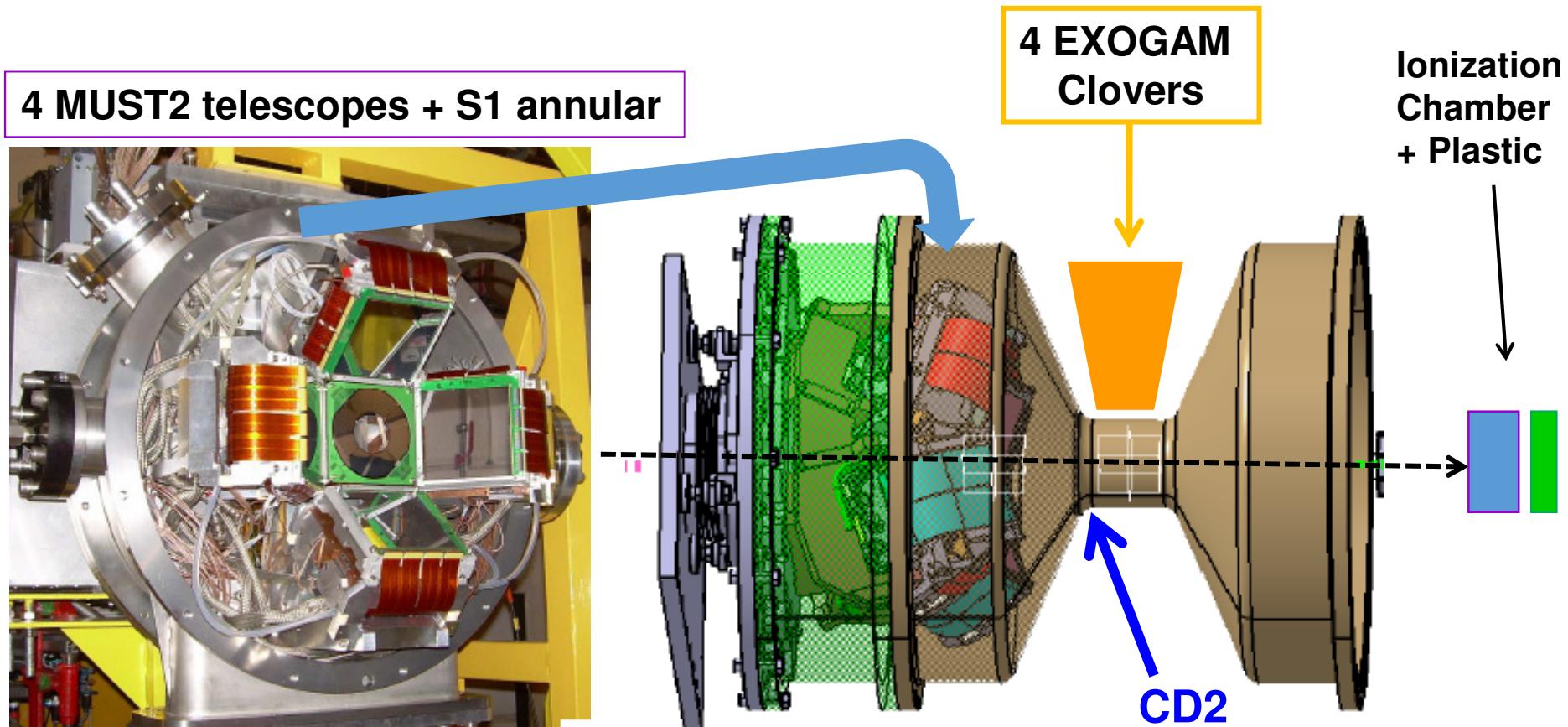
	Photopeak efficiency (%)		Peak-to-total (%)		D_{target} (mm)
	662 keV	1.3 MeV	662 keV	1.3 MeV	
EXOGAM configuration A ^a	28	20	57	47	115
EXOGAM configuration B ^b	17	12	72	60	150
Gamma-Cube ^c	15	10	72	60	68

(GEANT calc.)

Recent MUST2 campaign using fragmentation beams at LISE

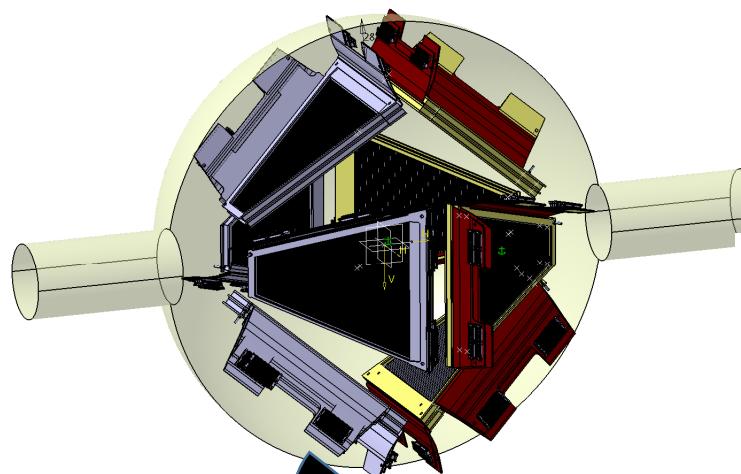
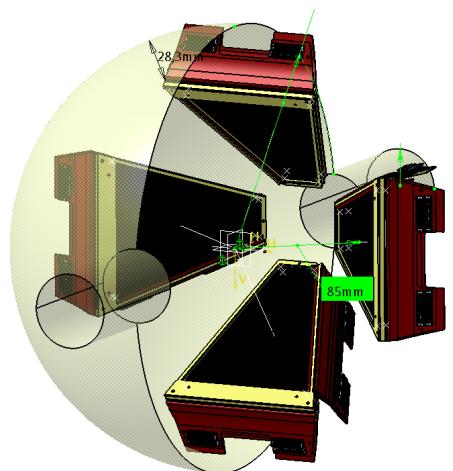
MUST2 + annular detectors combined with EXOGAM

- Density dependence of the $p_{1/2}$ - $p_{3/2}$ S.O. splitting $^{34}\text{Si}(\text{d},\text{p})$
SP: O. Sorlin (GANIL)
- Astrophysics – nucleosynthesis of ^{60}Fe $^{60}\text{Fe}(\text{d},\text{p})$
SP: F.Hammache, N. De Sérerville (IPNO)
- Shell structure evolution near N=40, towards N=50 $^{68}\text{Ni}(\text{d},\text{p})$
SP : G. Duchêne (IPHC), D.Beaumel (IPNO)



A MUGAST-EXOGAM configuration

(Conceptual design)

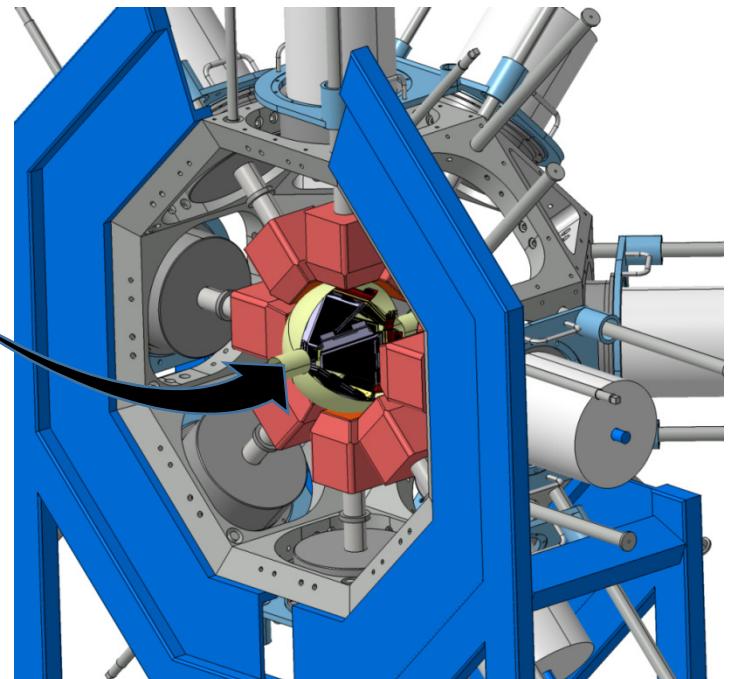


Chamber radius: 150mm
 $D_{target} = 85\text{mm}$

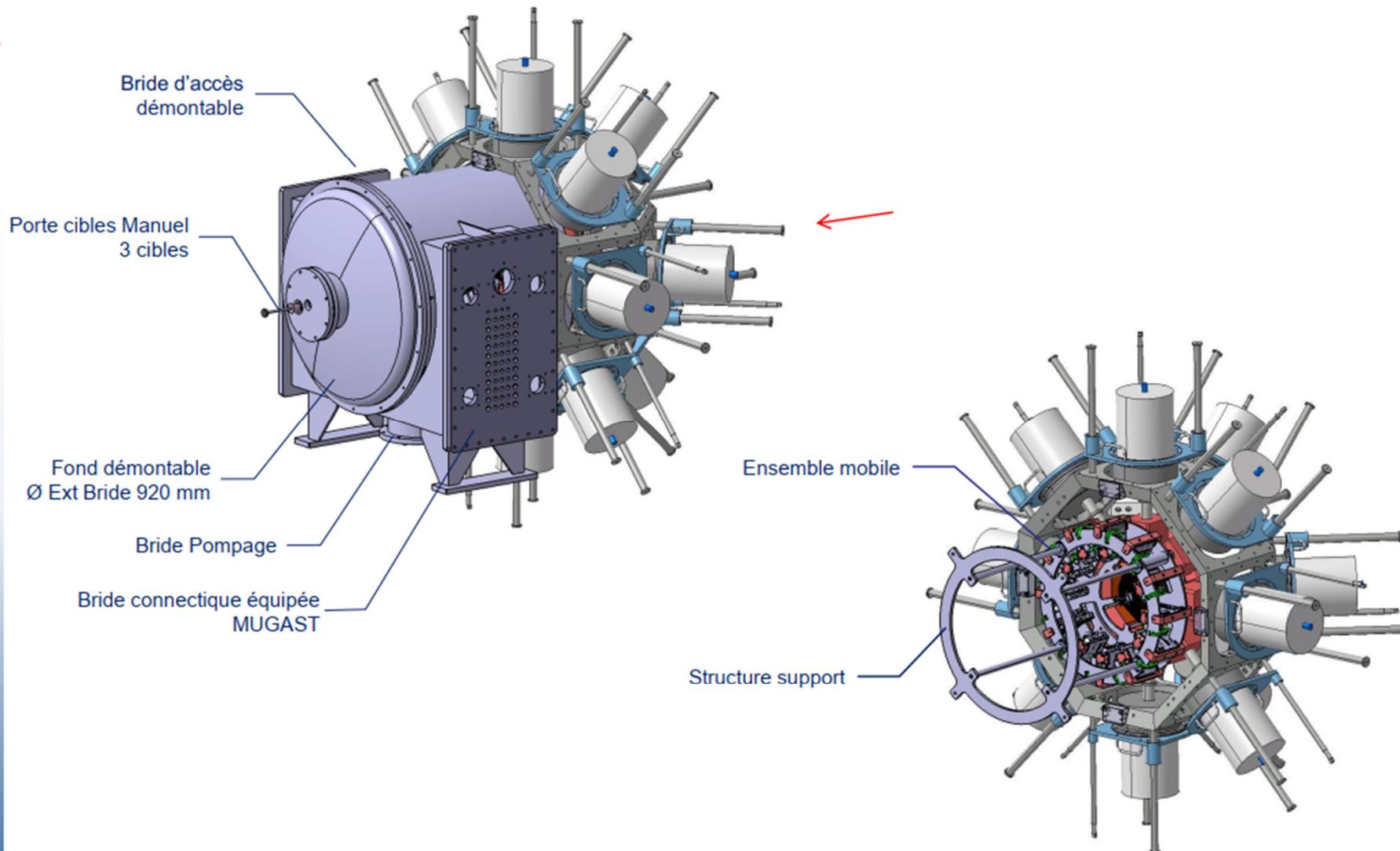
- Conceptual design based on the use of 2x4 GRIT Trapezoids
(2 layers : 0.5+1.5mm)
- MUST2 FEE to be deported upstream and/or downstream the detectors

Developments needed :
New chamber and new det↔FEE connectics

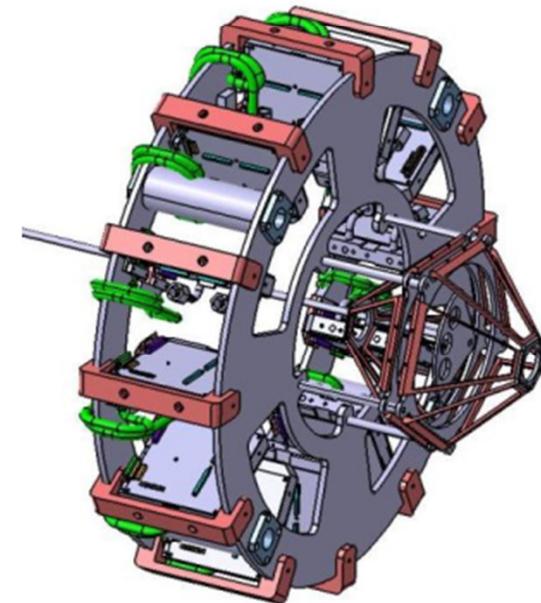
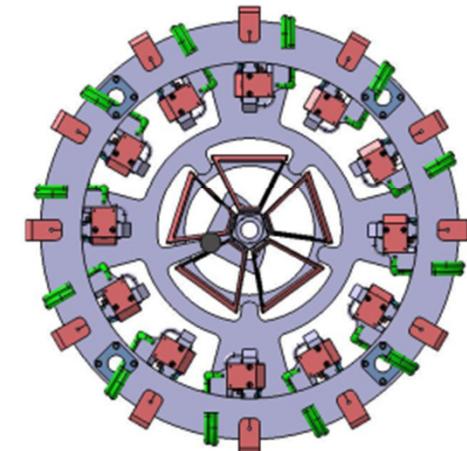
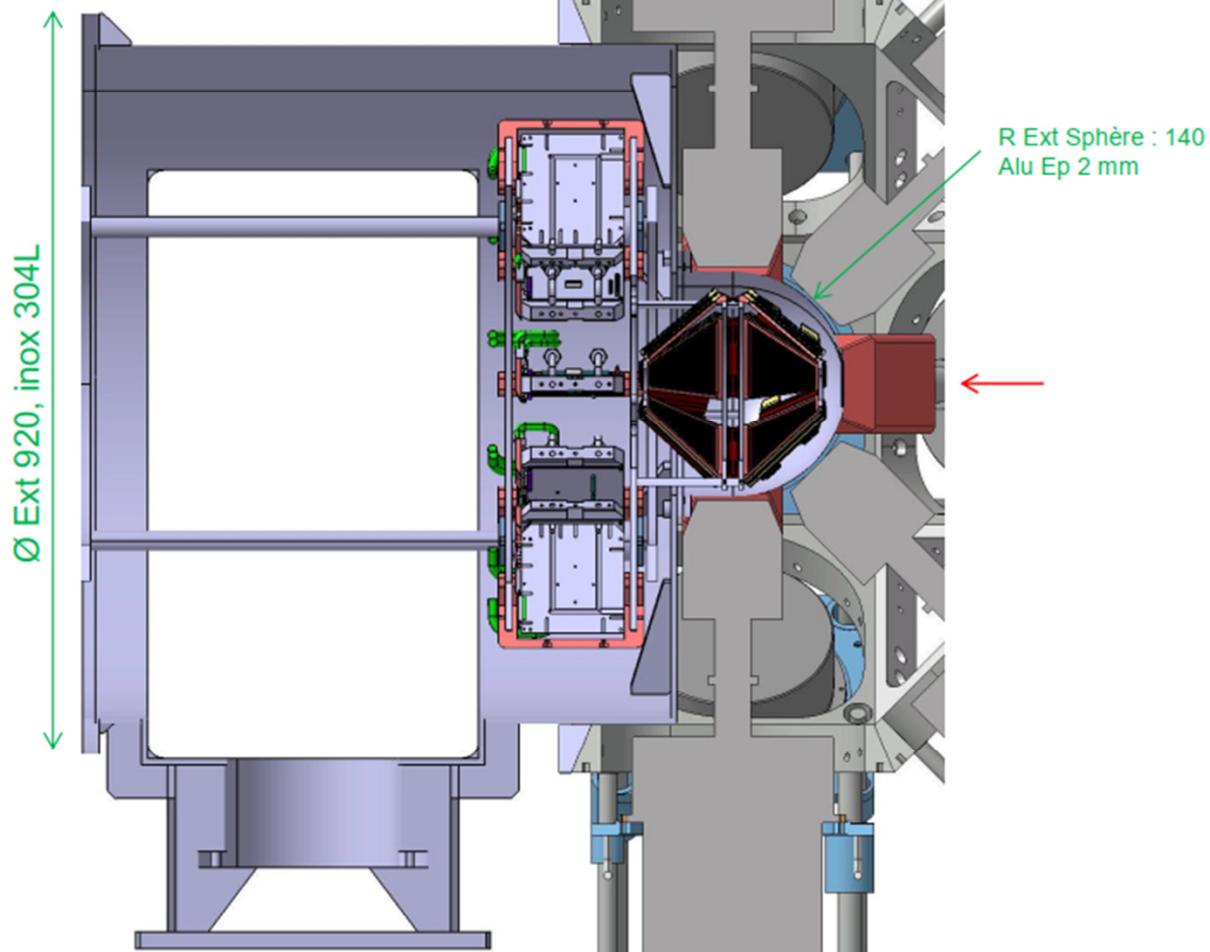
Design: E.Rindel



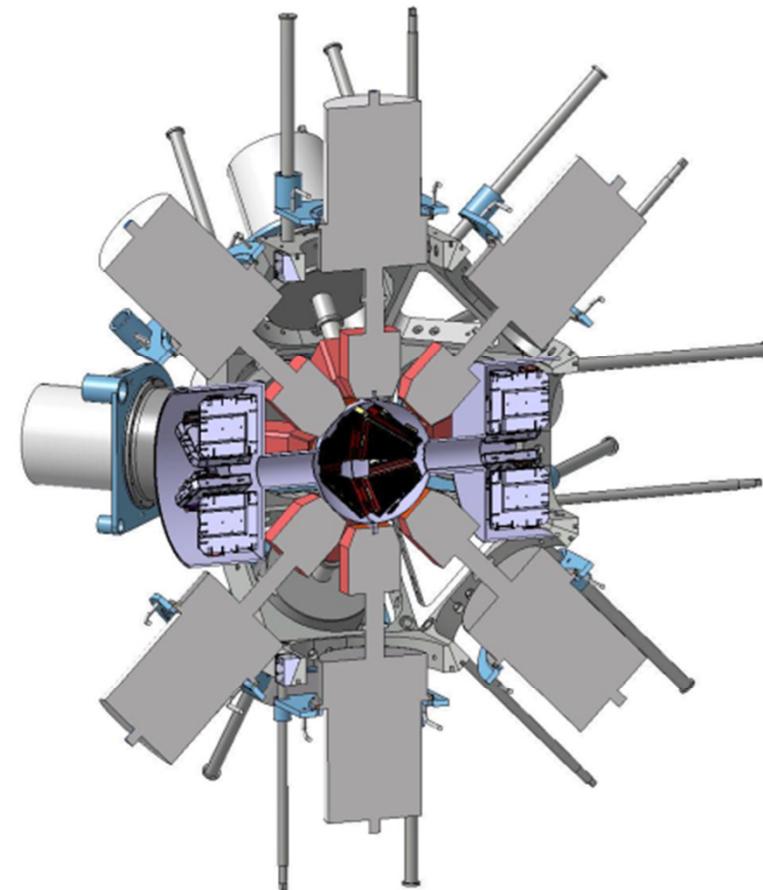
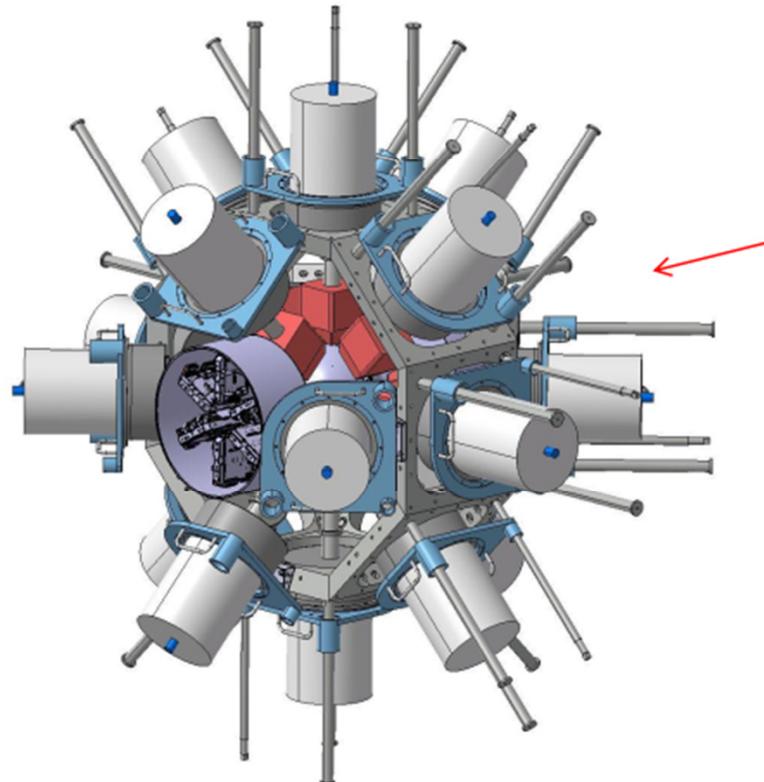
MGL : Solution N°1



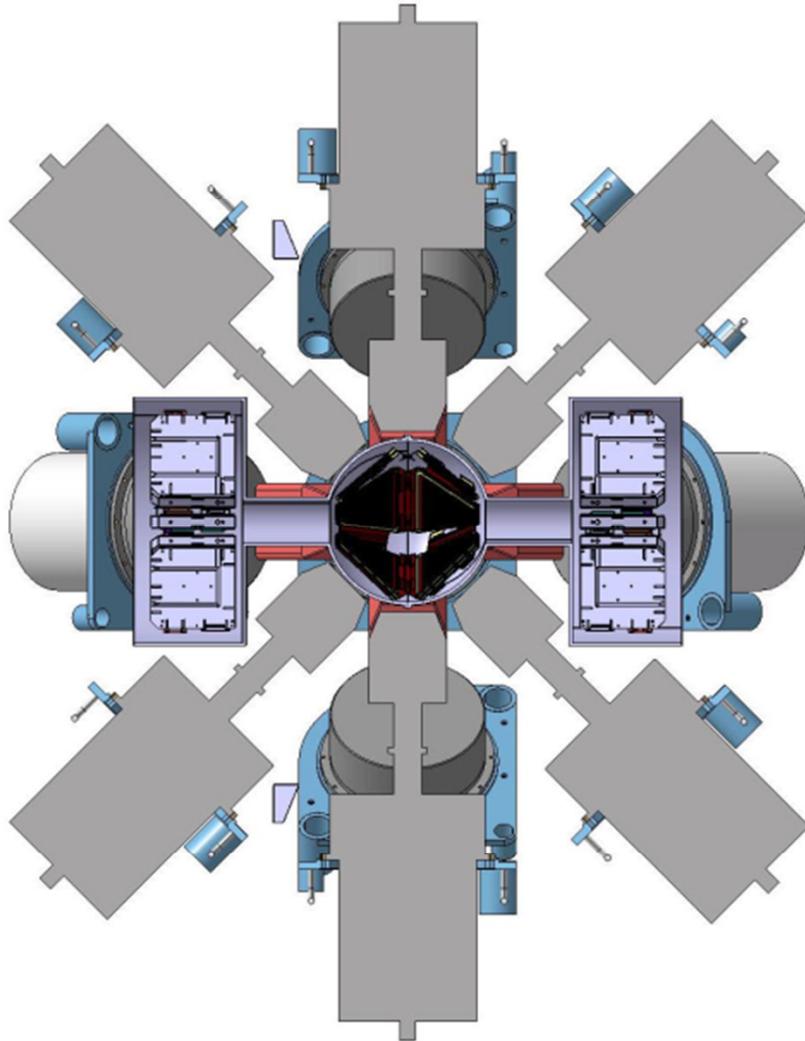
MGL : Solution N°1



MGL : Solution N°2

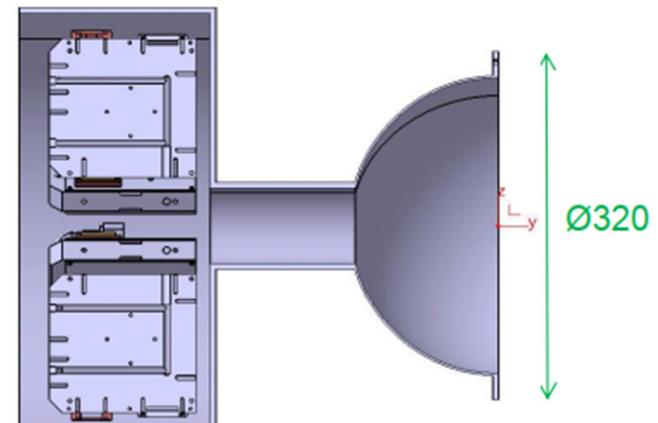


MGL : Solution N°2



+ 16 DéTECTEURS γ : 4 Pi
+ Compact

- Montage difficile des silciums
- Accès impossible après montage
- Nombre limité de blocs MUST : 6 + 6
- Brides connectiques spécifiques
- Câblage difficile
- Distance γ / cibles > 160 mm
- Epaisseur sphère > 2 mm
- Sphère en inox
- Pompage ?



Issues

- Integration of He target is difficult
- Losses due to interstrip (D=85mm)
- PID of recoil particle
D to target is typically 85 mm
 - Need good TOF for low E particles (No PSD)
 - Need second stage (thick Si)
- Electronics integration
- Solid target system
- Number of EXOGAM's available
- Helium target : Difficult !
- Tritium target ?

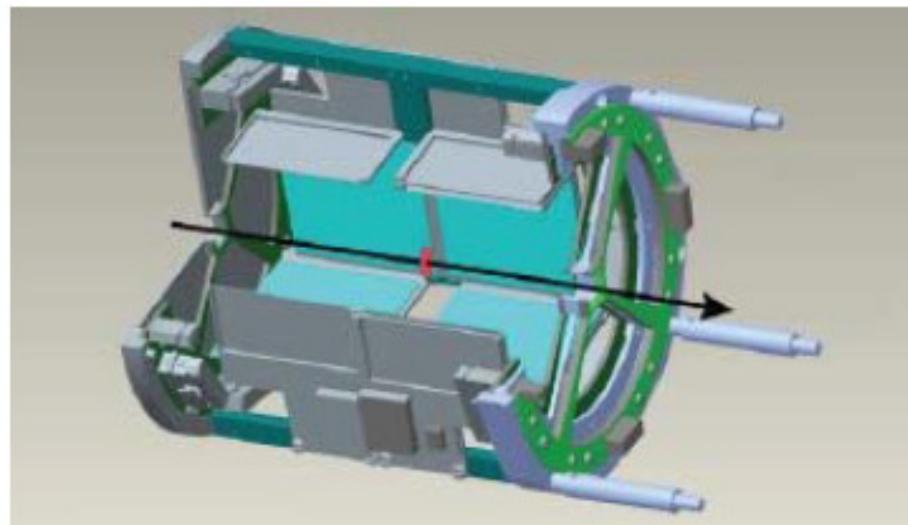
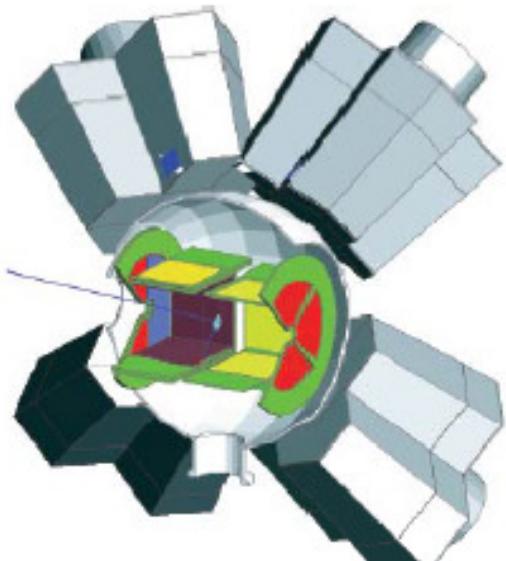
SETUP at ISOLDE

T-REX + MINIBALL

Miniball collaboration

Munich

Leuven



- Which compact configuration can we propose
(Efficiency of miniball, PID, etc...) ?
- Timeline : after shutdown (end of 2020)