



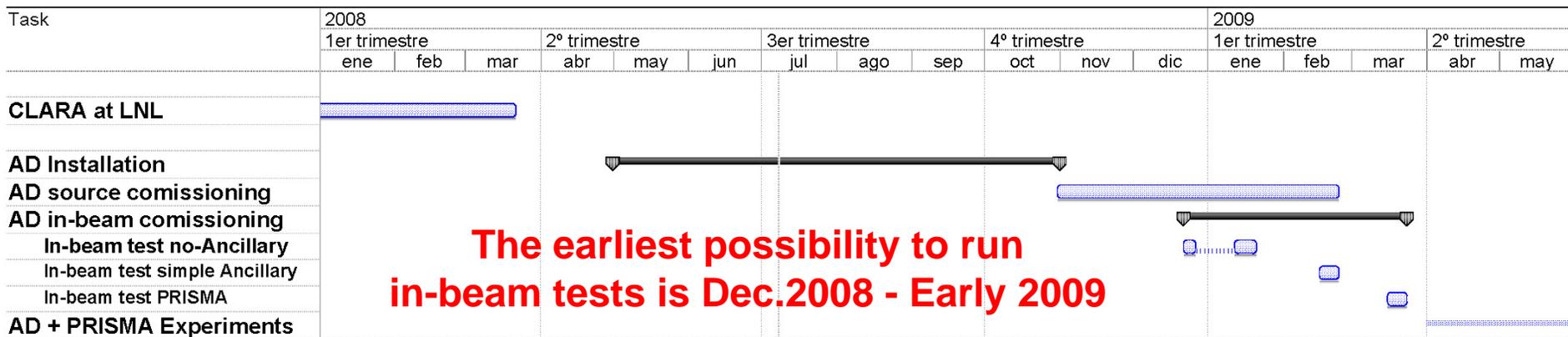
The AGATA Demonstrator at LNL: Complementary detectors for the next commissioning experiments

A.Gadea (CSIC-IFIC / INFN-LNL)

on behalf of the AGATA Collaboration

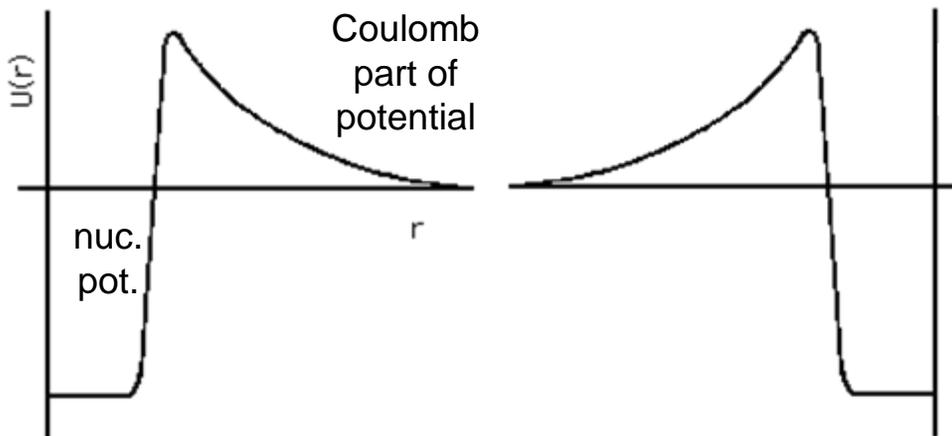
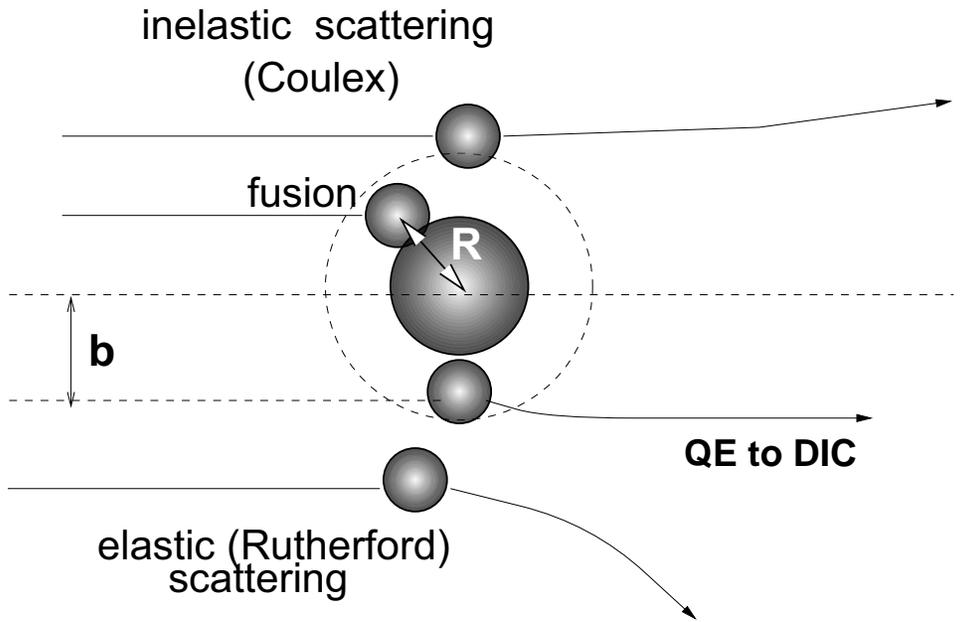


Commissioning Preliminary Plan



- **Phase 0:** commissioning with radioactive sources starting when detectors and electronics are available (even partially).
- **Phase 1:** easy test with tandem beams with no ancillary detectors. Radiative capture or fusion-evaporation reactions with light targets in inverse kinematics.
- **Phase 2:** test with a “simple” ancillary detector with limited number of parameters (DANTE). Coulomb excitation reactions with medium mass beams ($A < 100$) in inverse kinematics.
- **Phase 3:** test with PRISMA with multi-nucleon transfer reactions and at high multiplicity with appropriate ancillaries.

Low Energy reaction mechanisms used for γ -Spectroscopy



Smaller impact parameter "b"

- Coulomb excitation and Inelastic scattering.
- Transfer and quasi-elastic processes (p,n capture...).

- Multi-nucleon transfer.
- Deep Inelastic Collisions.
- Quasi-fusion reactions.

- Radiative capture and Fusion with light particles evaporation .

- Fusion with evaporation of Massive Fragments (IMF)
- Fusion-fission

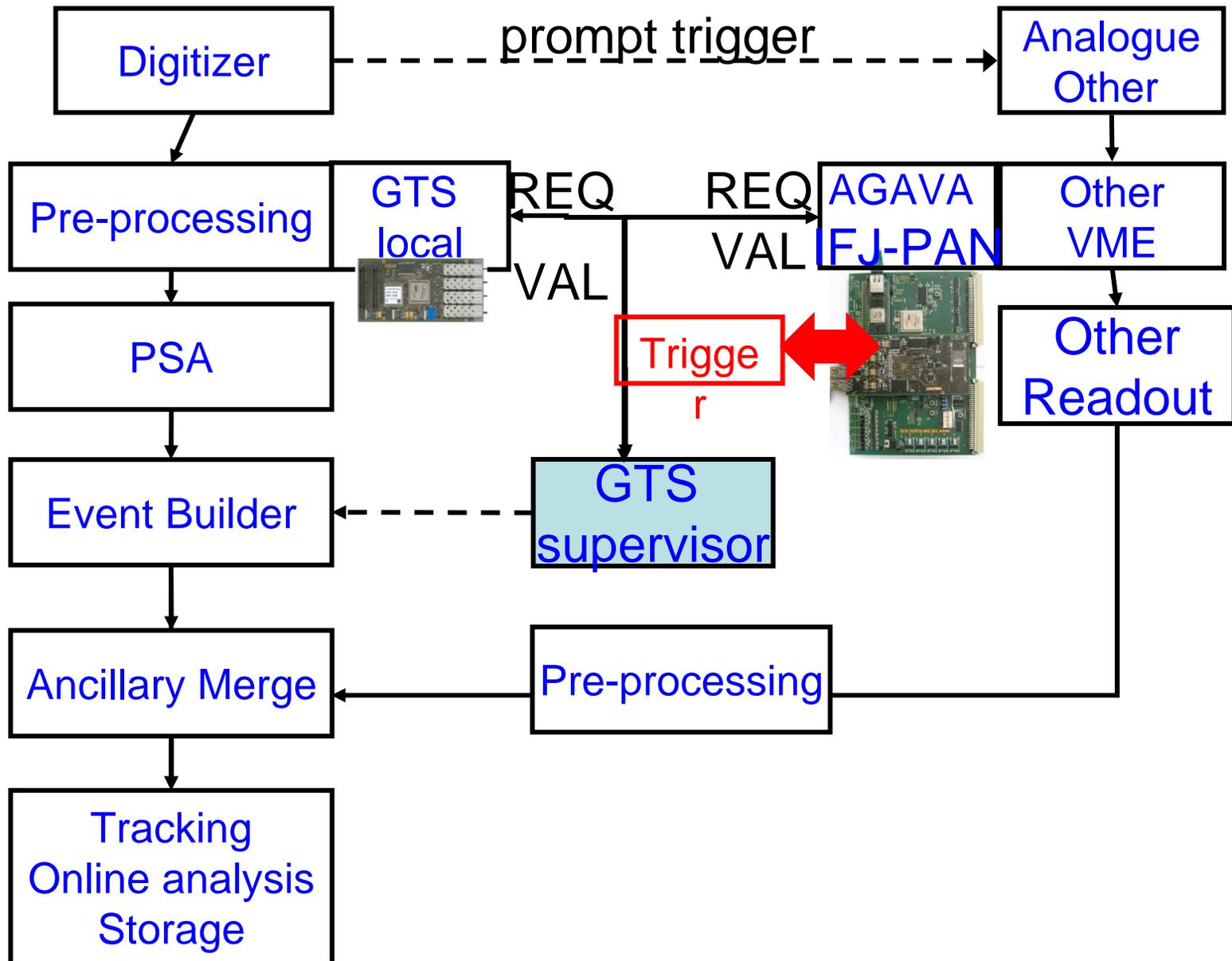
Program for the in-beam commissioning until summer

- **May 2009: probably few days of “any beam available”
→ Probably again fusion-evaporation with light target**
- **June 2009: short run (~4 days) probably with “simple”
ancillary detectors → Coulex or direct reactions.**
- **July 2009: short run (~4 days) probably with “simple”
ancillary detectors → Coulex or direct reactions.**

Meaning of “simple” ancillary detectors:

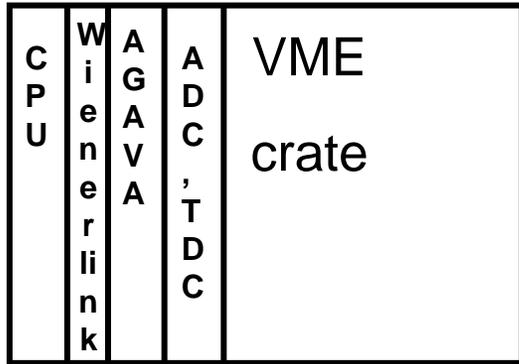
- **Strongly depends on the “complexity” we will be able
to manage with the GTS and the available ancillary
DAQ.**
- **In any case a limited complexity of ancillaries with
reduced setting time and possibility of on-line
analysis**

AGATA and Other Detectors



Complementary detectors Front-End DAQ & readout

PRISMA Front-End (Nicola Toniolo INFN-LNL)

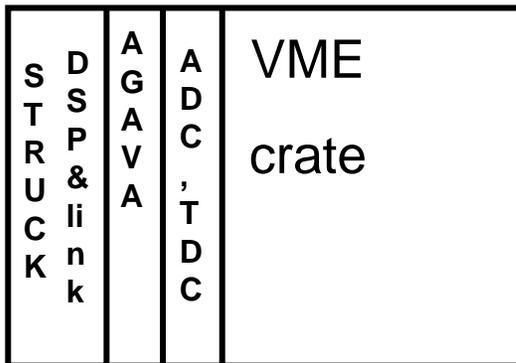


Based on XDAQ
linux software
Wiener VME link
FPGA inside



V785 Peak sensing ADC
(32 Channels)
V775 TDC common
START/STOP
(32 Channels)
V830 Scaler
(32 channels)

HELENA Front-End (Sergio Brambilla INFN-Milano)



Based on KMAX
Windows software
Struck optical link
with DSP & Memory



V785 ADC
V775 TDC
Scalers and
other standard VME
modules

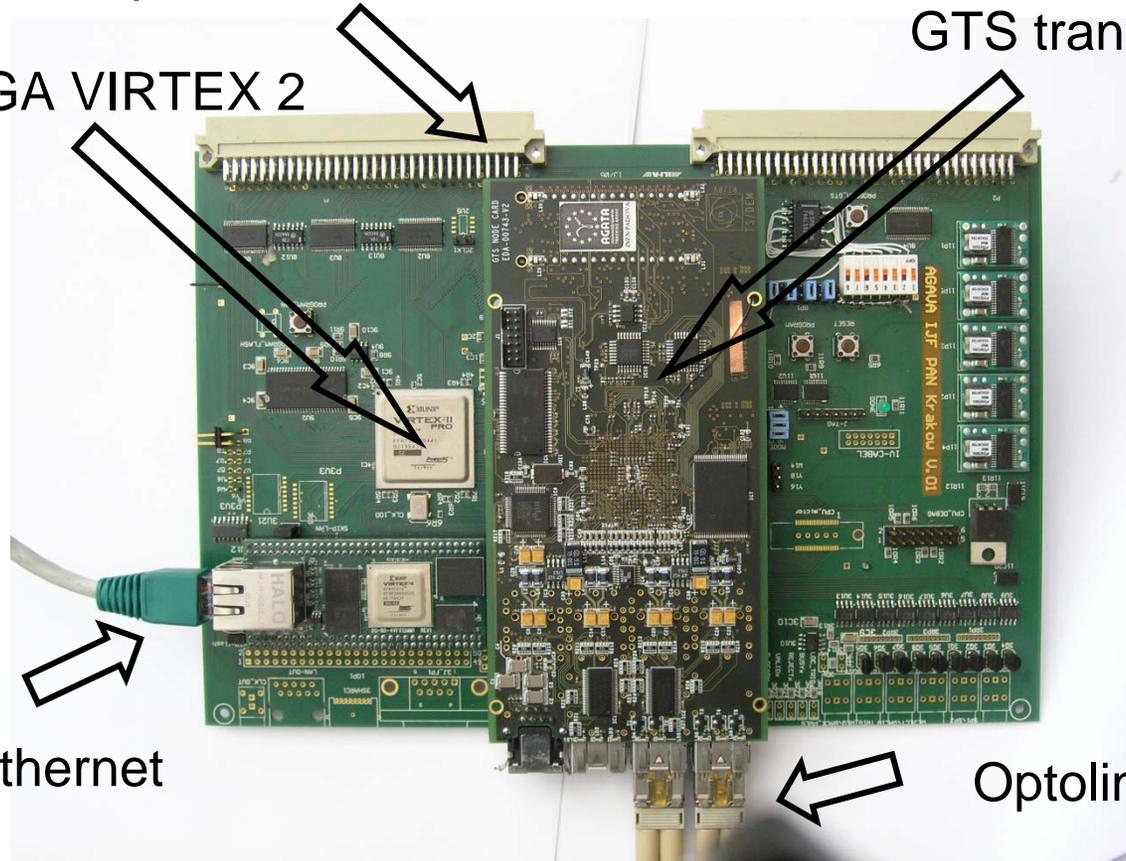
AGAVA VME card

IFJ-PAN, Kraków & INFN-Milano

VME backplane connector

FPGA VIRTEX 2

GTS transceiver



Ethernet

Optolink to GTS



AGATA
ADVANCED GAMMA
TRACKING ARRAY

Possible Trigger / DAQ modes:

Only trigger:

Possibility to use GTS + AGAVA to send a trigger tag to AGATA, ancillary trigger without ancillary detector data and DAQ ? i.e. is possible to open an acquisition gate with GTS + AGAVA?

Only acquisition:

Whenever an ancillary trigger present: acquisition of time stamped ancillary data in parallel with the AGATA data with off-line (or on-line if possible) merging and analysis.

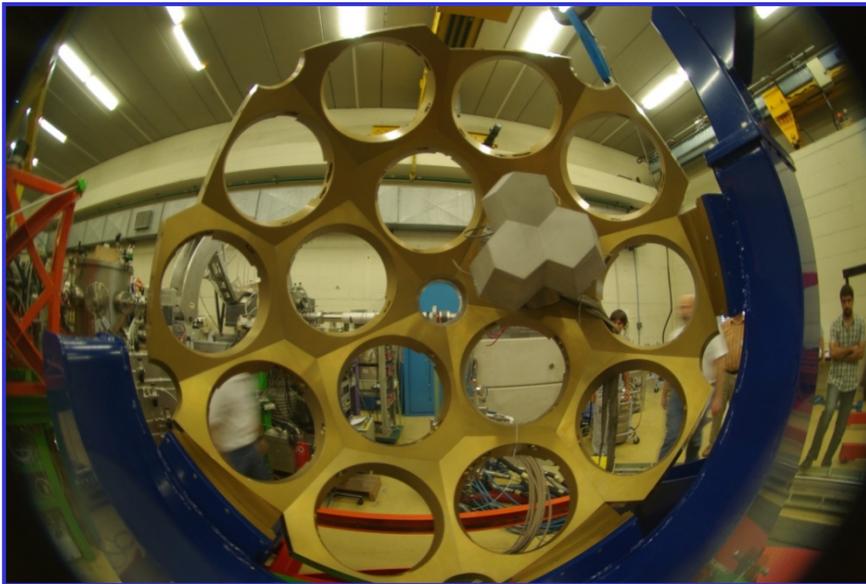
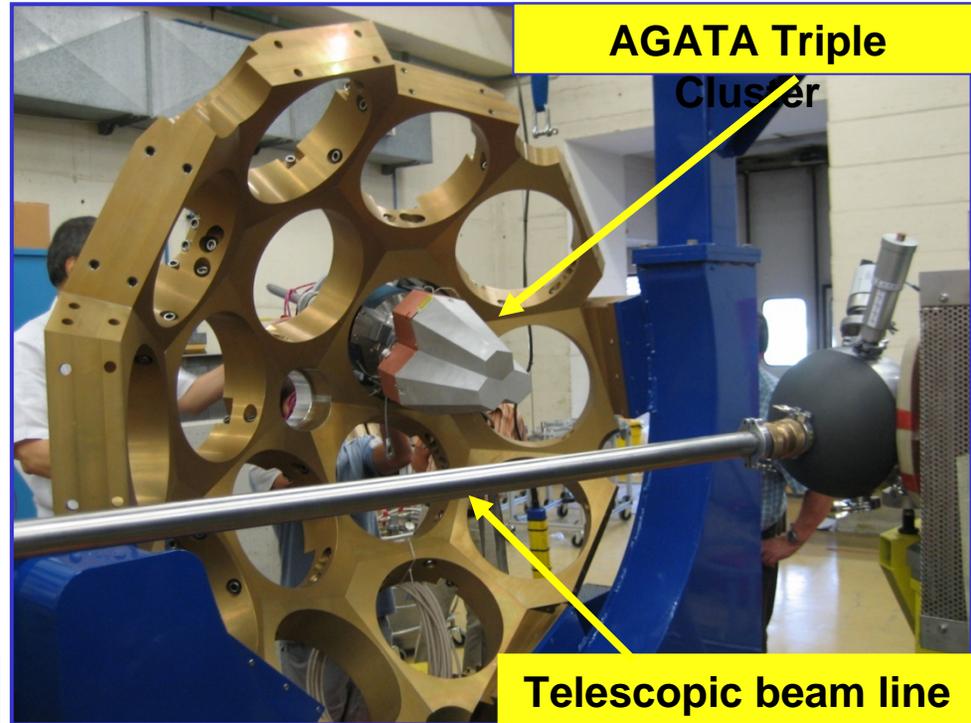
Full:

Ancillary devices participated in trigger and are acquired only with successful trigger. Merging and on-line analysis by Narval + user libraries.

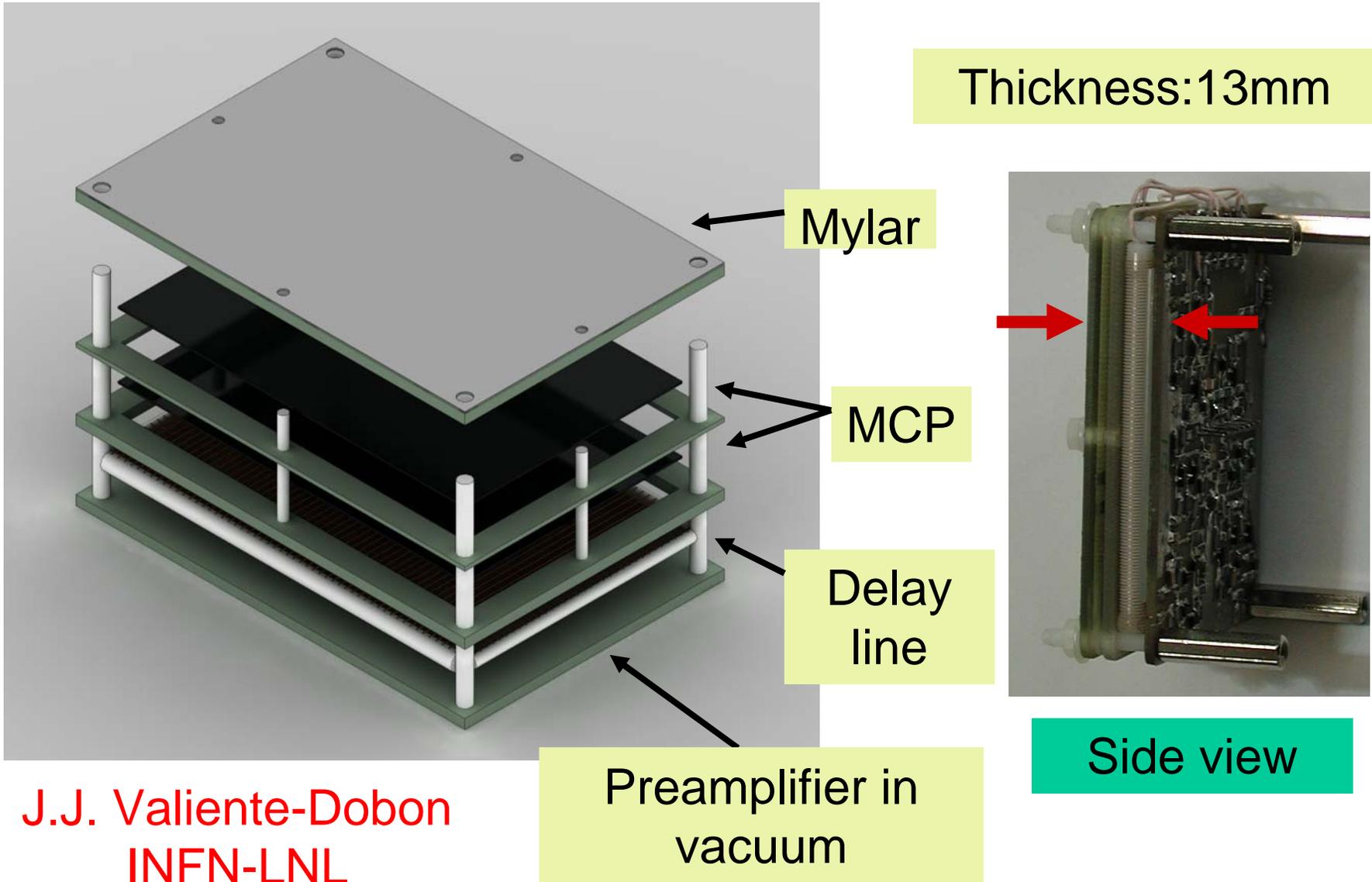
→To be explored with GTS group

Status of the AGATA demonstrator at LNL

The first subset of AGATA (the Demonstrator Array) will start operation during 2009 at the Laboratori Nazionali di Legnaro. Installation and commissioning are in progress.

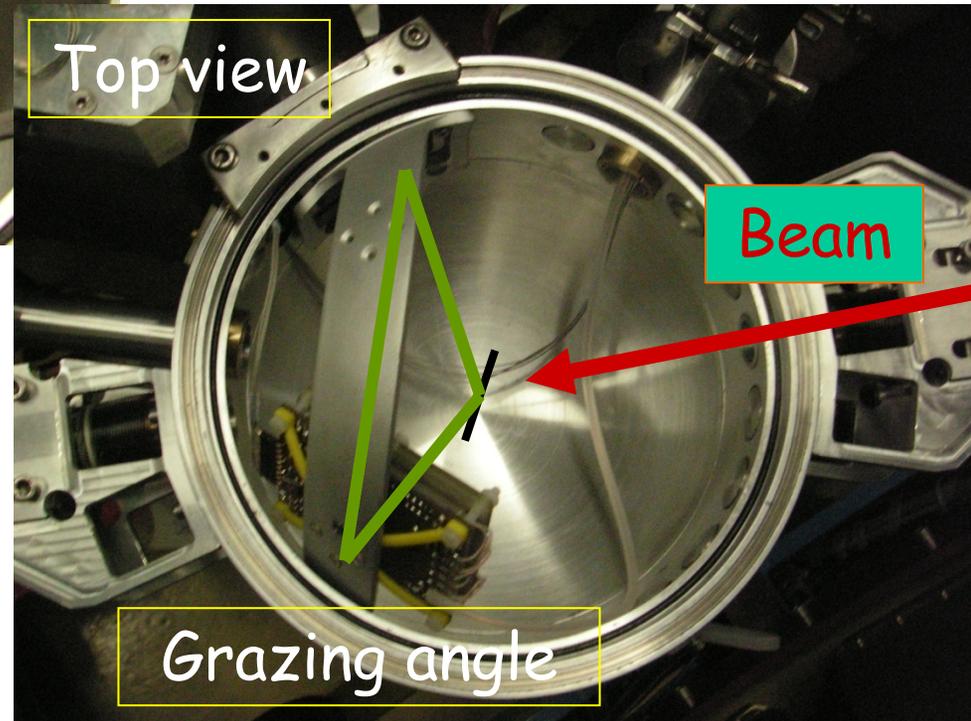
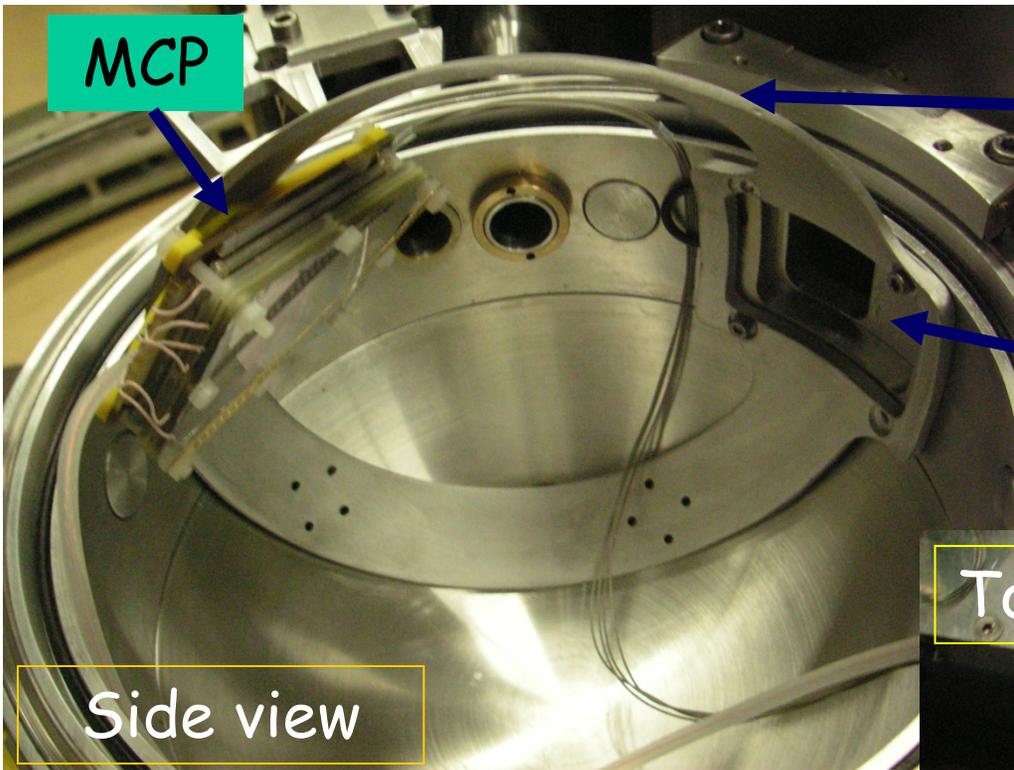


The DANTE heavy ion position sensitive detectors



J.J. Valiente-Dobon
INFN-LNL

DANTE in the CLARA reaction chamber



Reaction chamber of
CLARA-PRISMA

J.J. Valiente-Dobon
INFN-LNL

DANTE support design and construction



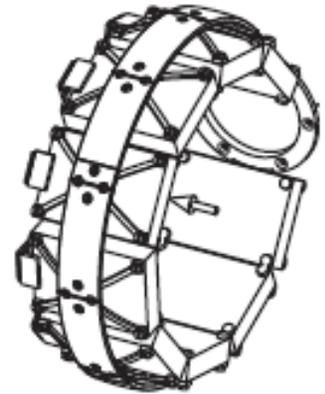
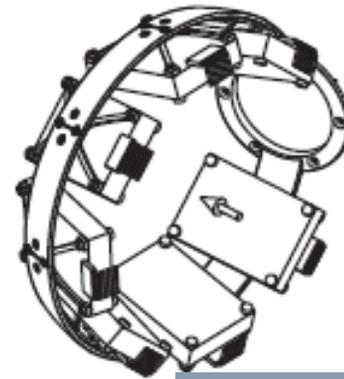
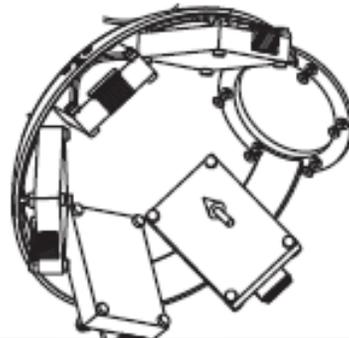
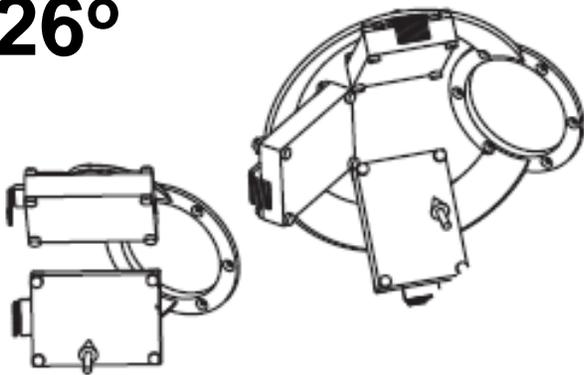
42°

58°

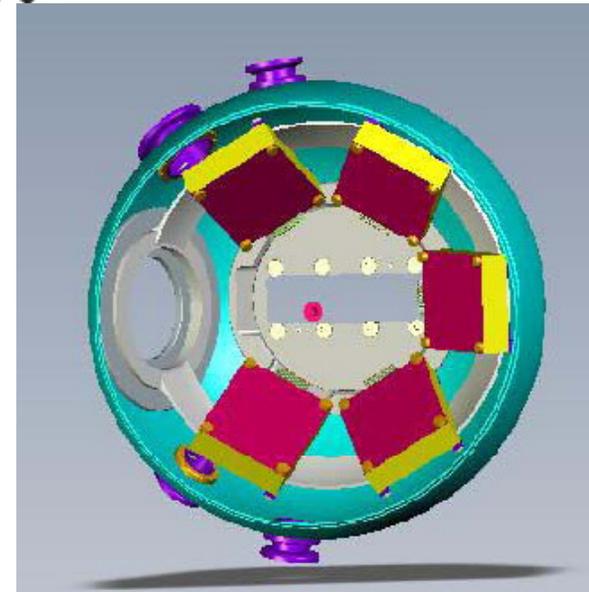
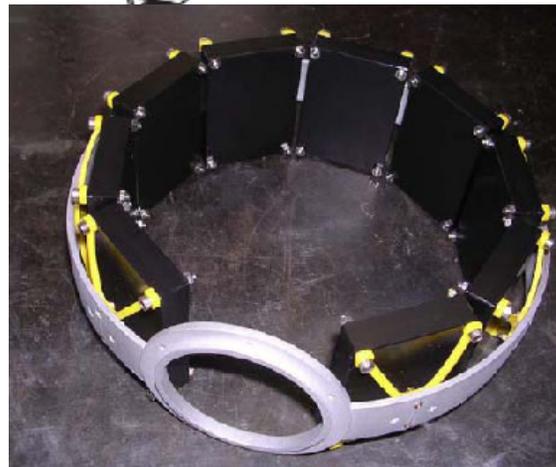
74°

26°

90°

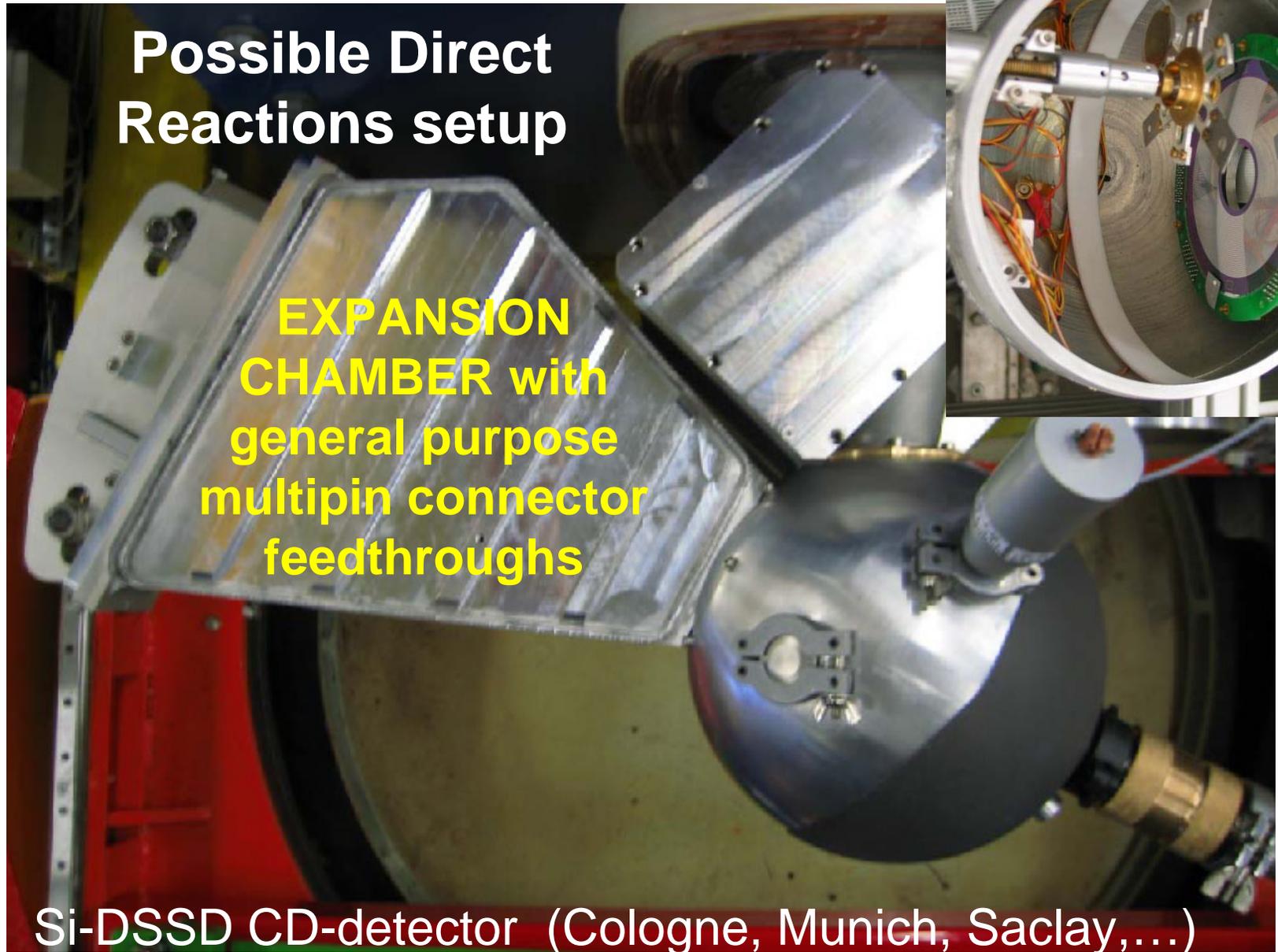
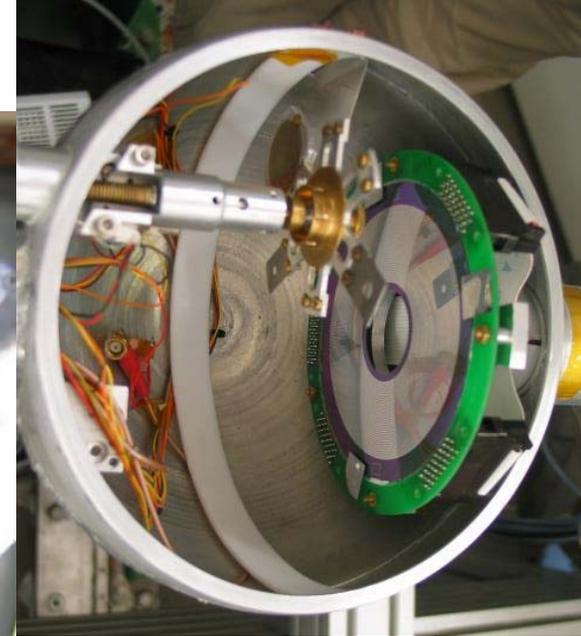


INFN-Milano
and INFN-LNL



Possible Direct Reactions setup

EXPANSION CHAMBER with general purpose multipin connector feedthroughs



Si-DSSD CD-detector (Cologne, Munich, Saclay,...)