Argonne Gas-filled Fragment Analyzer

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Collaboration

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- *University of Edinburgh*
- P.J. Woods
- *Lawrence Berkeley National Laboratory*
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- *Oregon State University*
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Physics program

- Heavy nuclei
  - Discrete in-beam γ-ray spectroscopy, calorimetry
  - K-isomers
  - alpha decay, spontaneous fission
  - Mass measurements, laser spectroscopy
  - New SHE searches, chemistry (future)
- Proton-rich nuclei
  - ^{100}Sn region
  - Fast deformed proton emitters
  - Heavy proton emitters
- Nuclei around N=126
  - Deep inelastic reactions

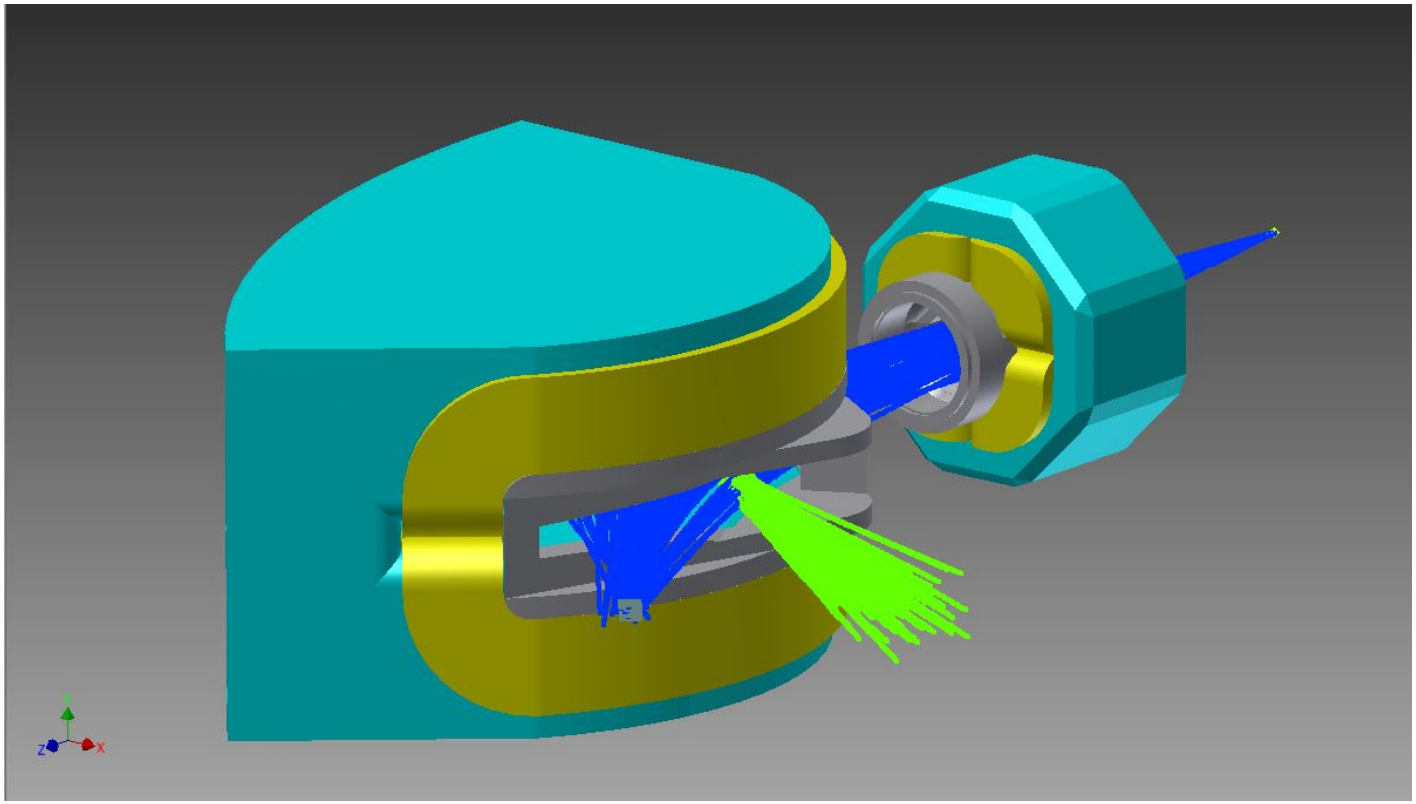
AGFA - Argonne Gas-filled Fragment Analyzer

Use Combined Function bending magnet

$Q_v D_m$ design

38° bend
22.5 msr @ 80cm
(44 msr @ 40 cm)

2.5 Tm max Bρ
4.2 m total length
(3.9 m @ 40cm)



Enough space to accommodate a 4π Ge array

Compact focal plane

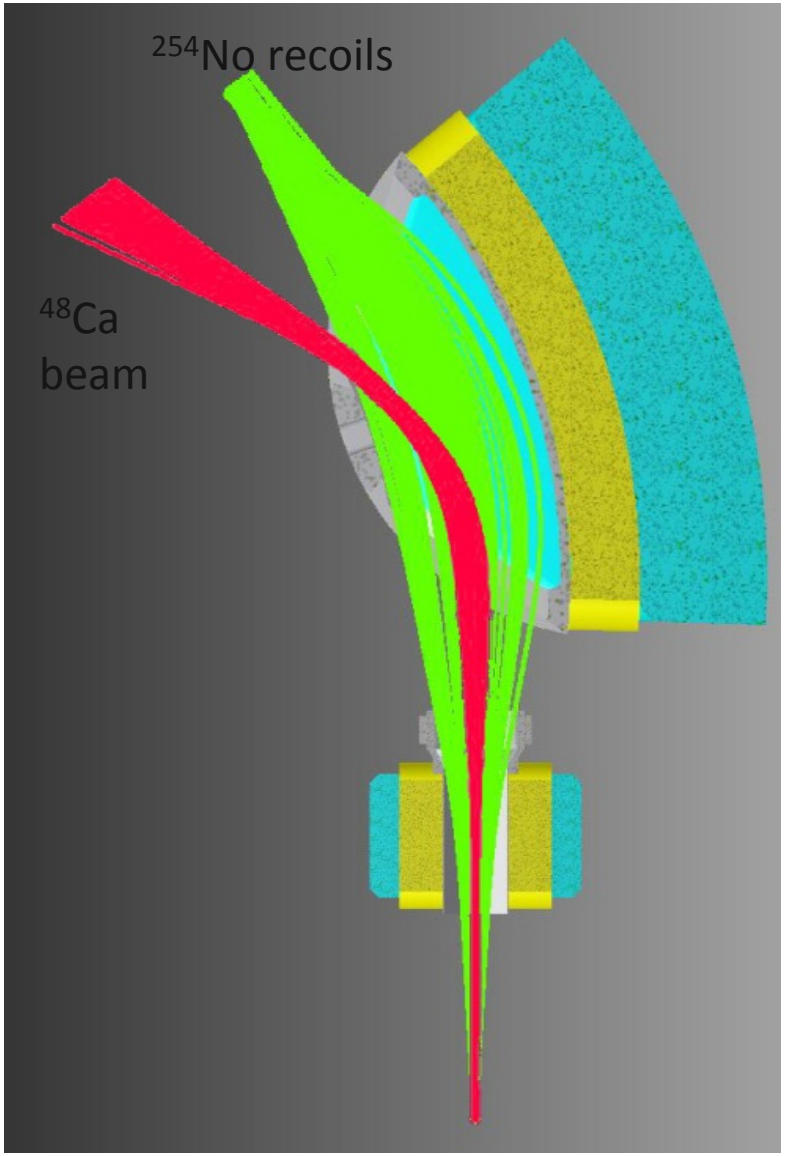
^{254}No test case

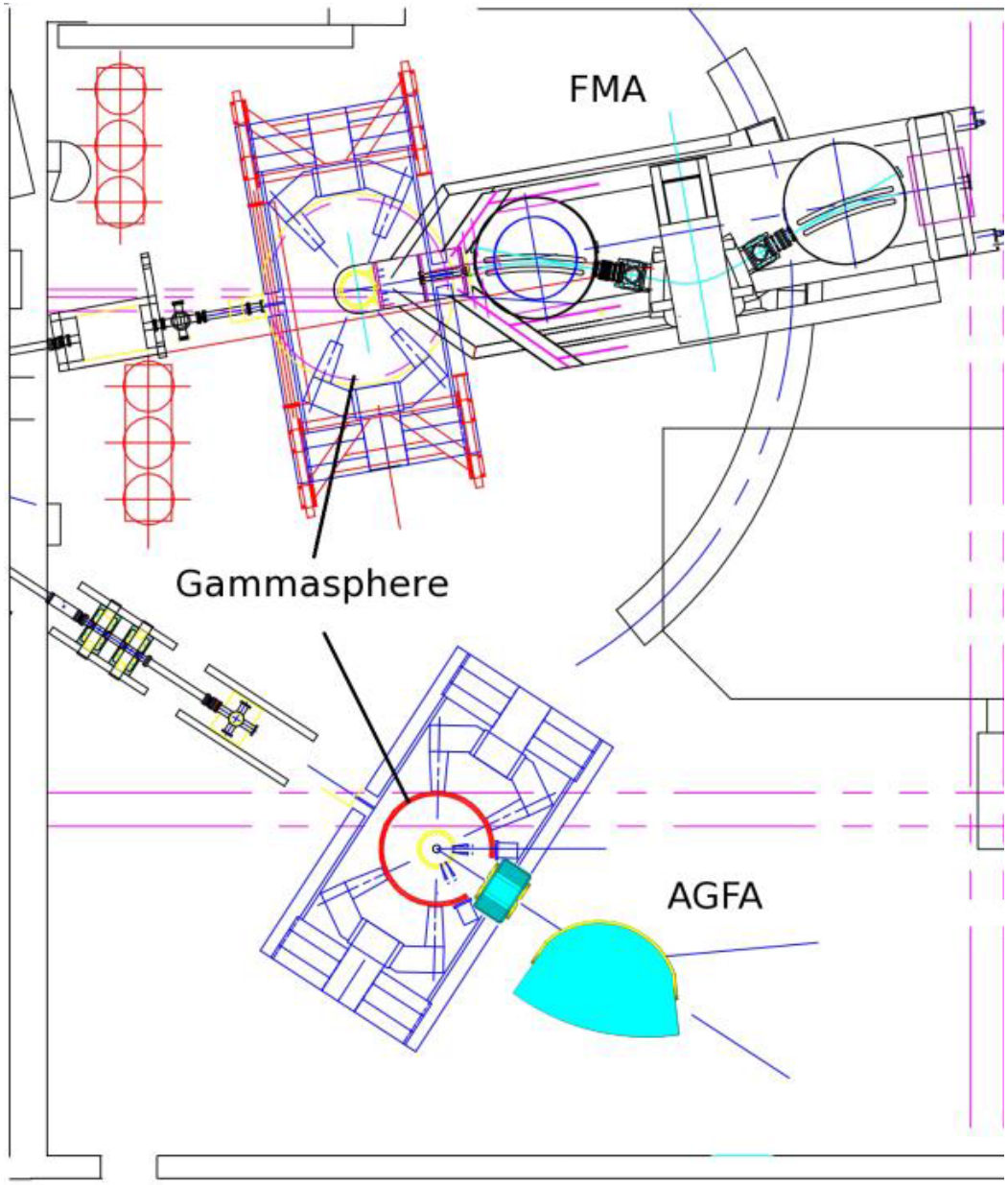
$^{48}Ca + {}^{208}Pb \rightarrow {}^{254}No + 2n$

$E_{beam} = 220$ MeV

- 1 Torr He, 5 x 2 mm beam spot
- ^{254}No angular distr: Gaussian, $\sigma = 51$ mr
- ^{48}Ca stripped, (C foil) $q_{bar} = 17.1$

- 89% of ^{254}No transported to focal plane
- 71% fall within a 64 x 64 mm^2 DSSD
- Solid angle to DSSD is 22.5 msr.
- Beam is well separated.





Status:

Design for the magnets is completed

Bid packages ready

Commissioning in early 2017