

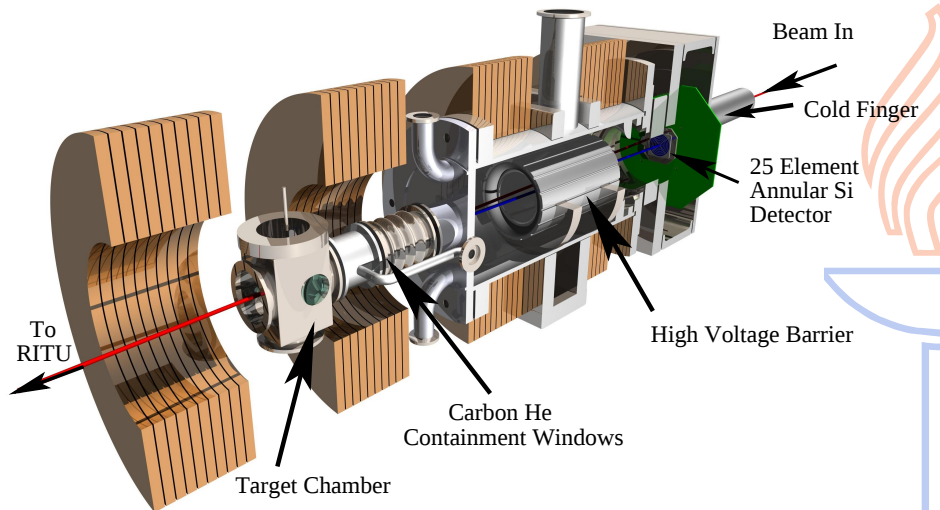
Electron Spectroscopy at JYFL

PTG, Juha Sorri, et al.,

Department of Physics
University of Jyväskylä

Daresbury
2.9.2005

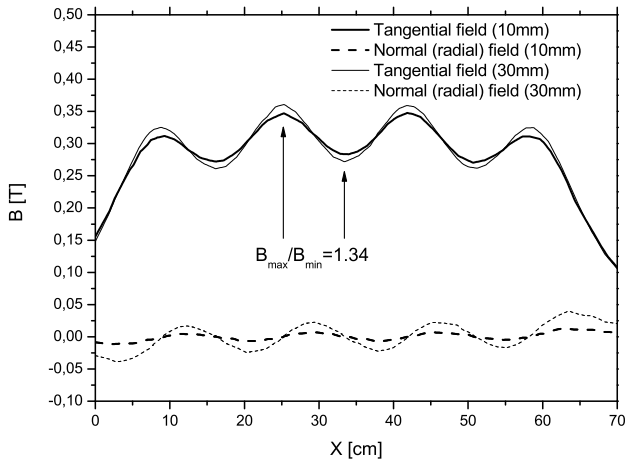
The SACRED Electron Spectrometer



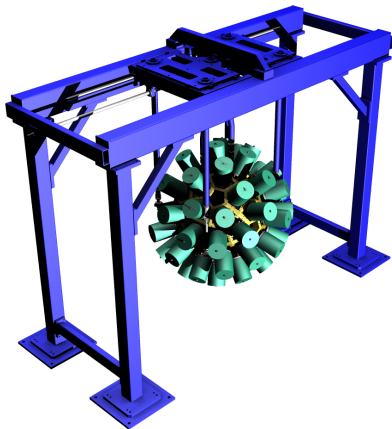
H. Kankaanpää et al., NIM A534, 503 (2004)

P. A. Butler et al., NIM A381, 433 (1996)

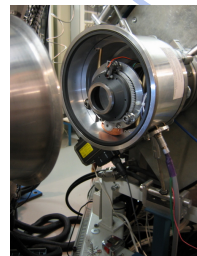
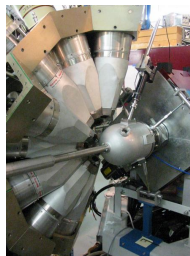
Field Profile - 560A



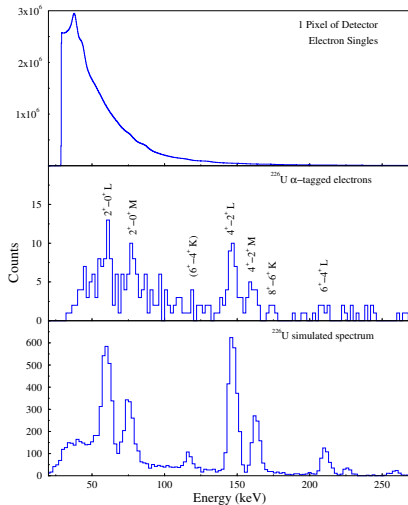
The JUROGAM Germanium Array



- 43 Phase I and GASP-type Ge detectors - EUROBALL and U.K.-France loan pool
- Total Photopeak Efficiency 4.2% @ 1.3 MeV
- Software Compton suppression
- Autofill system built by University of York, part of GREAT
- Target chamber built by IReS Strasbourg, allows use of rotating target wheel
- Modified EUROGAM support structure

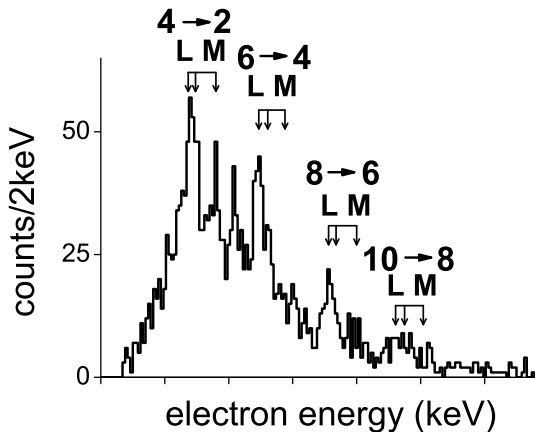


RDT with SACRED



H. Kankaanpää et al.,
NIM A534, 503 (2004)
see also:
R.D. Humphreys et al.,
PRC69, 064324 (2004)

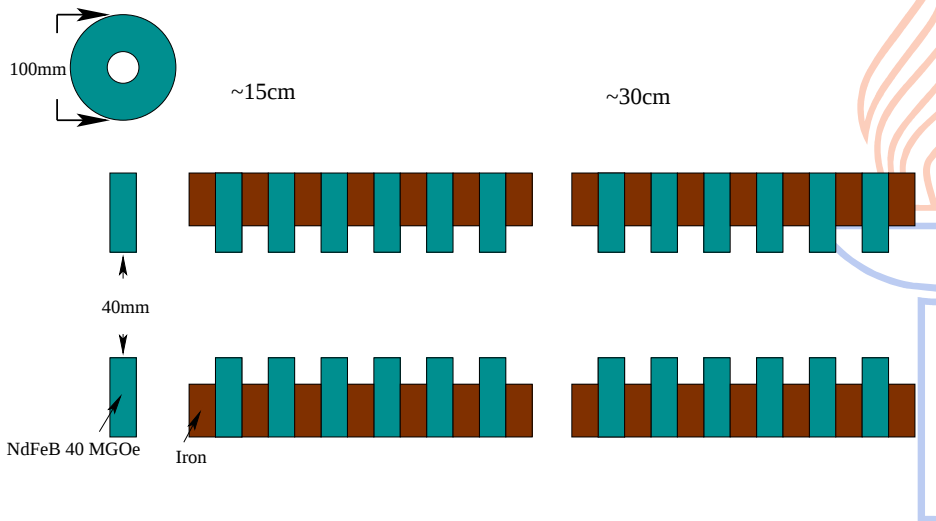
Conversion Electron Spectroscopy of ^{254}No



P.A. Butler et al., PRL89, 202501 (2002)

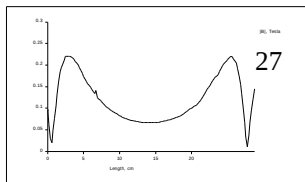
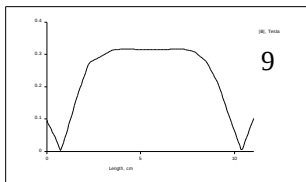
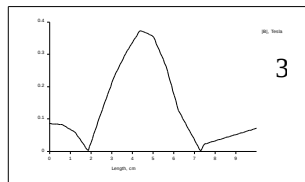
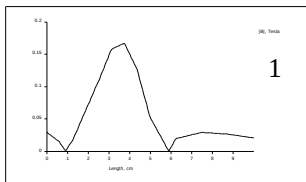
R.D. Humphreys et al., PRC69, 064324 (2004)

Permanent Magnets

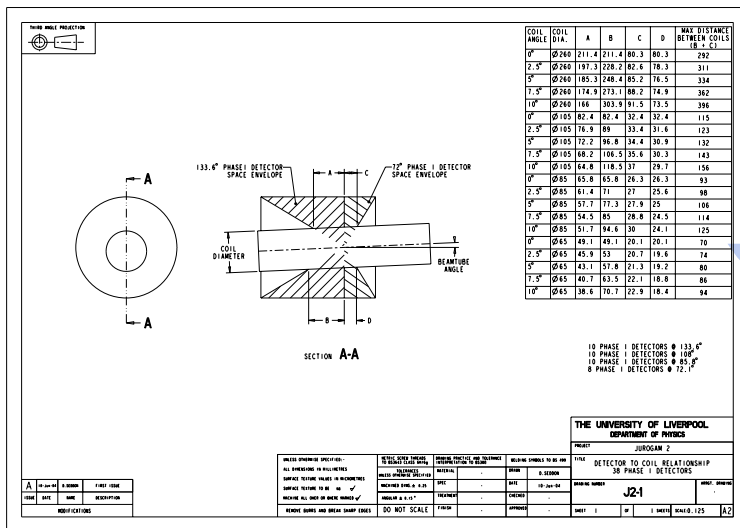


Permanent Magnets

Permanent Magnet Solenoid

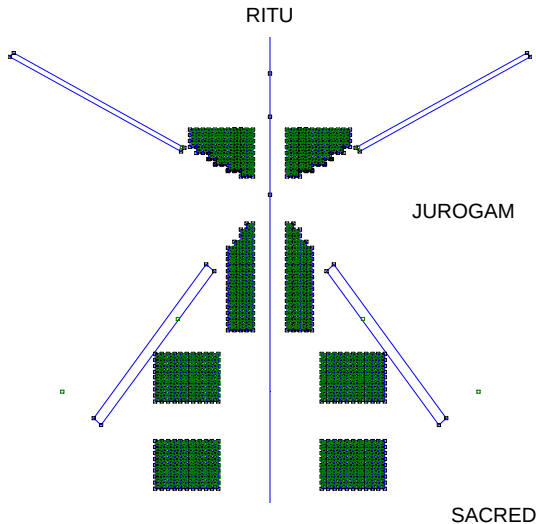


Electromagnets - Possible Geometry?

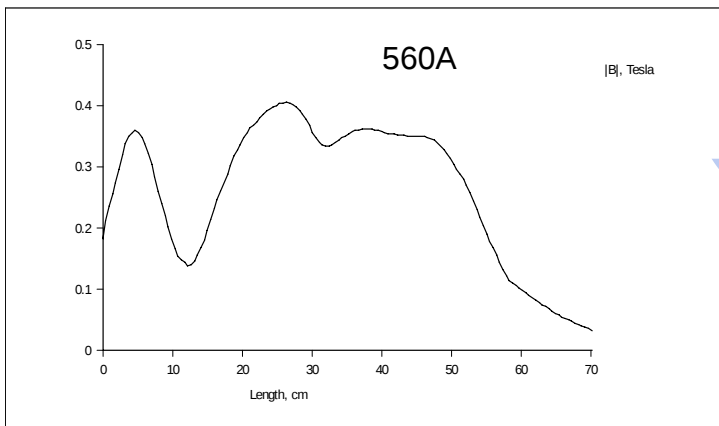




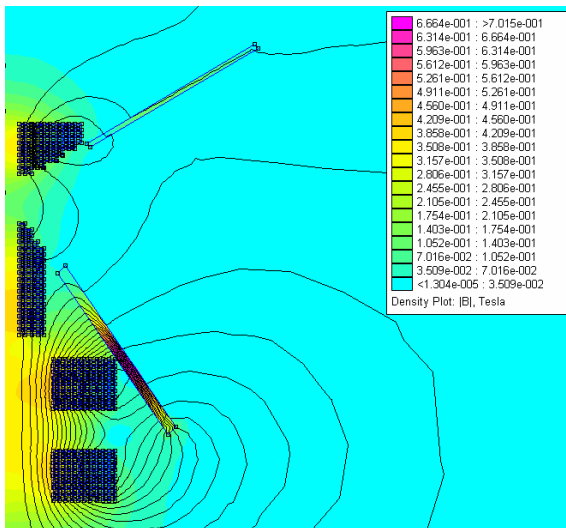
Electromagnets - Possible Geometry?



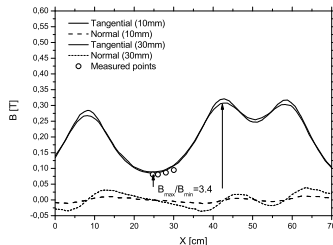
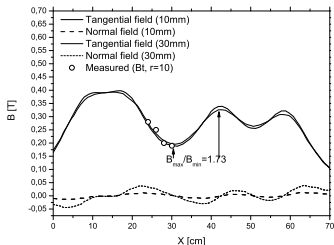
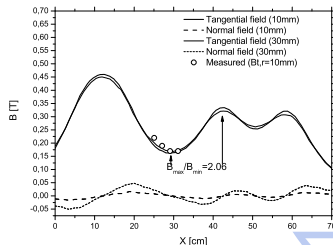
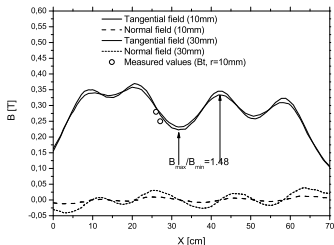
Field Profile 560A



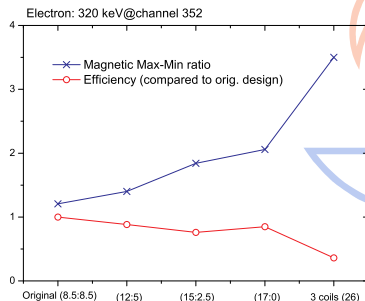
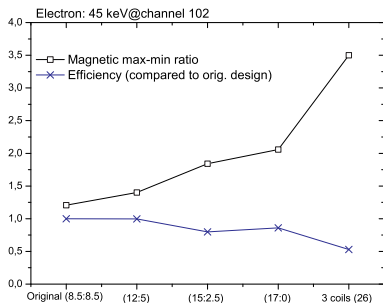
Field Profile 560A



Attempt to Simulate Pocket in Field

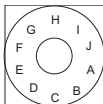


Attempt to Simulate Pocket in Field



Effect of Stray Field on Photomultiplier Output

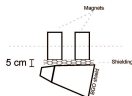
Tube labels
(SFC34)



Angle=0

Distance between SACRED
center line and

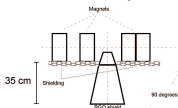
Tube A=20cm
Tube C=25cm



Angle=90

Distance between SACRED
center line and

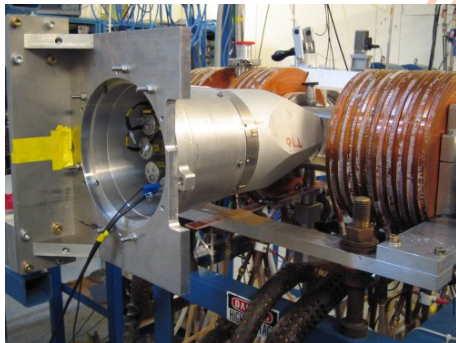
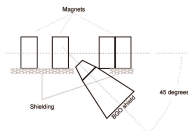
Tube A=40cm
Tube C=40cm
Tube A offset from BGO center
line 5cm
Tube C is on BGO center line



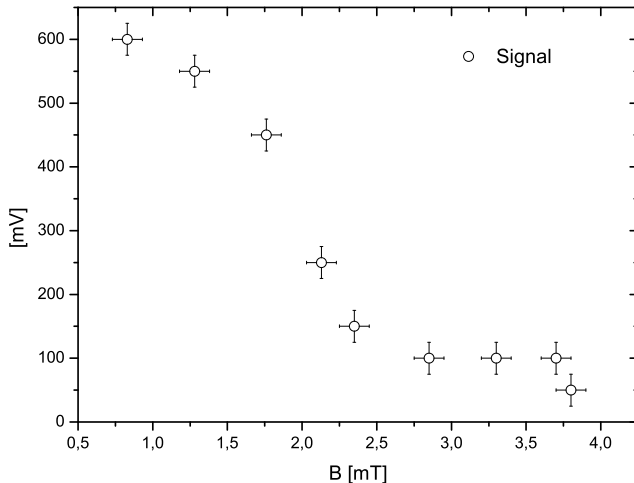
Angle=45

Distance between SACRED
center line and

Tube A=30cm
Tube C=34cm

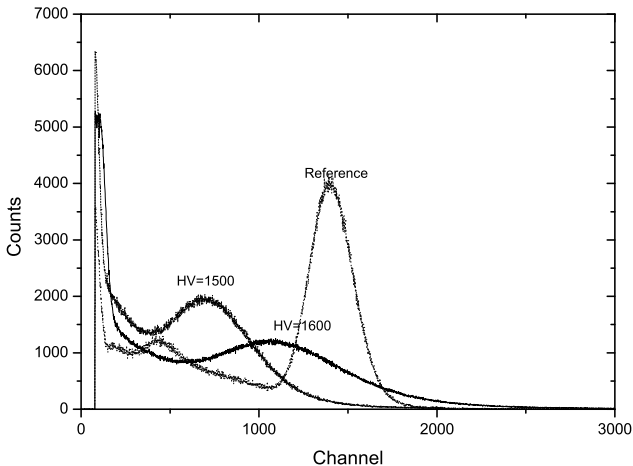


Effect of Stray Field on Photomultiplier Output

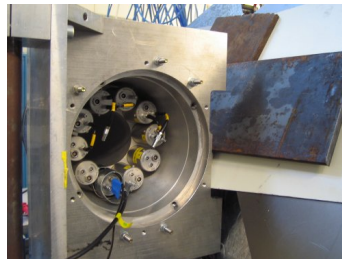
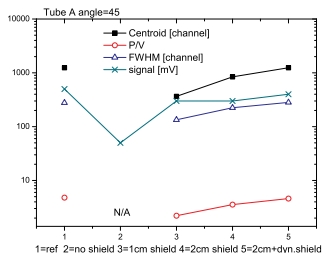
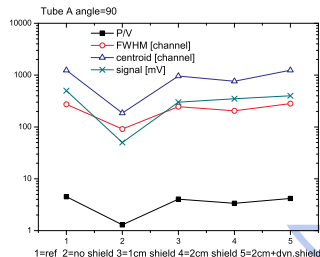
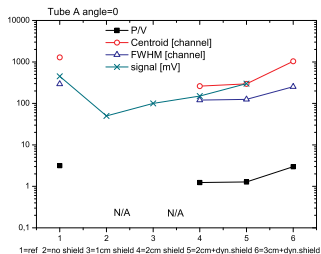


HV adjusted to
give 1mV/keV,
 ^{137}Cs source

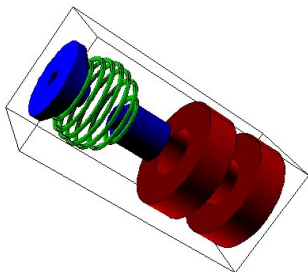
Effect of Stray Field on Photomultiplier Output



Effect of Stray Field on Photomultiplier Output



Where Do We Go From Here?



- More Simulations (2D/3D) FEMM/RADIA
- Build Prototype
- Test Efficiency
- Detector Design
- Infrastructure - Cooling/Support/Target Chamber....