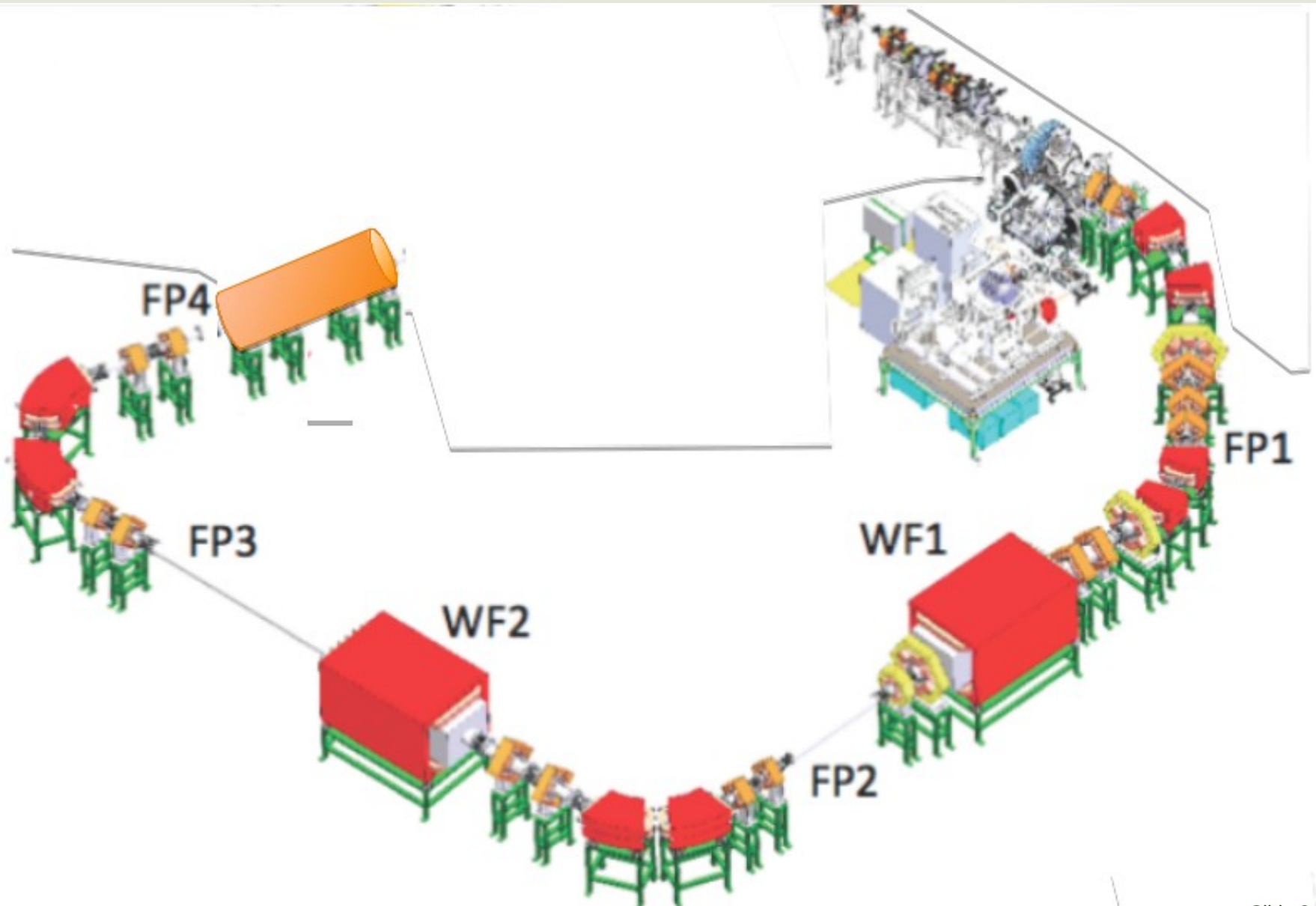




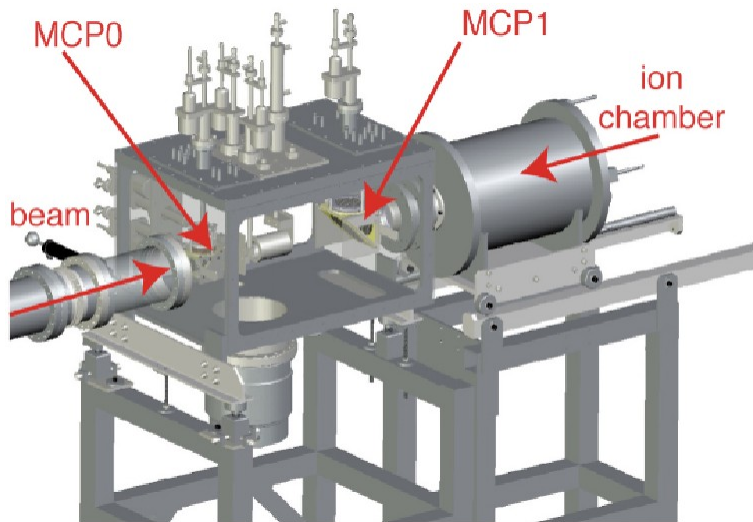
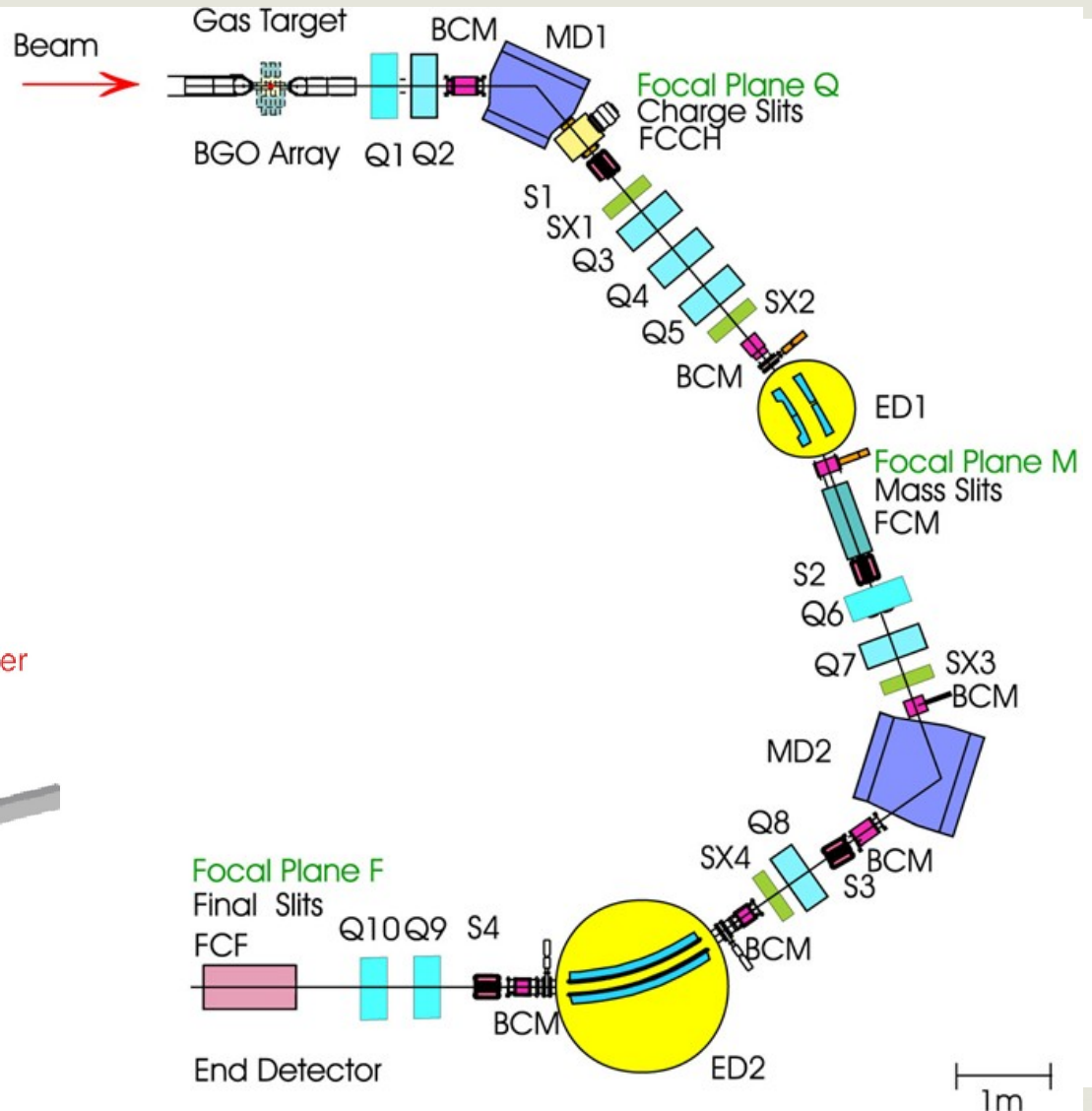
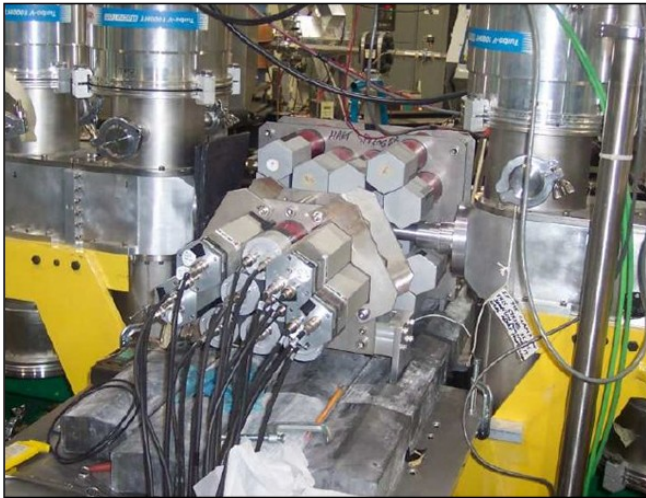
# SECAR Data Acquisition Plans

Ulrike Hager

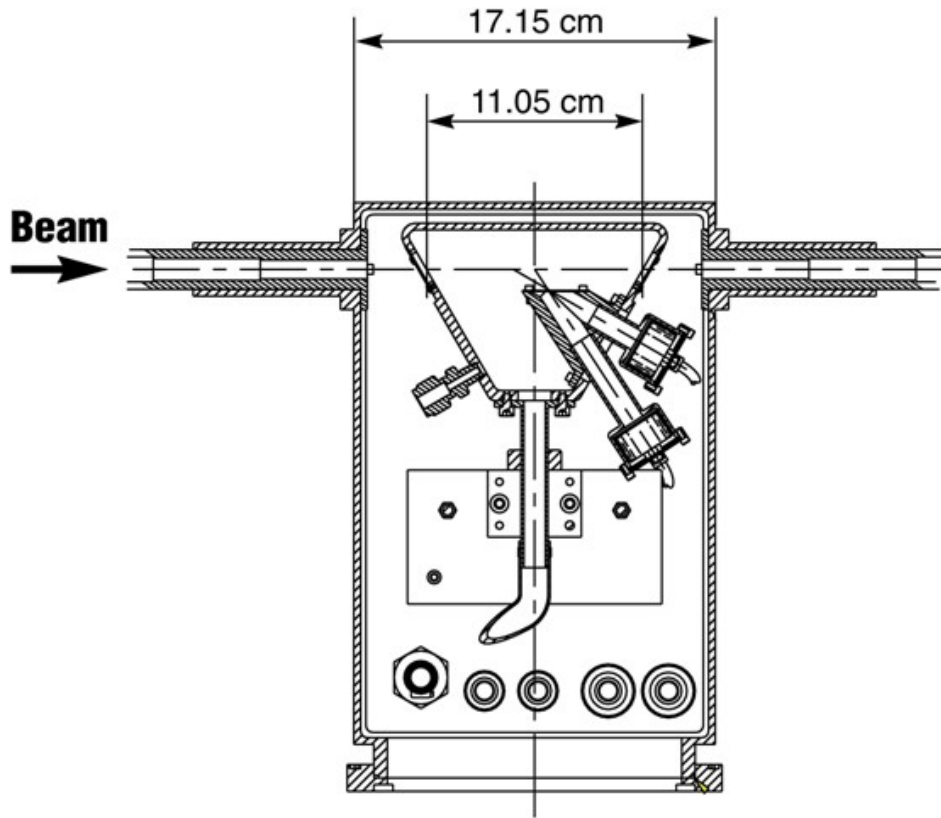
# SECAR recoil separator



# A similar facility: DRAGON

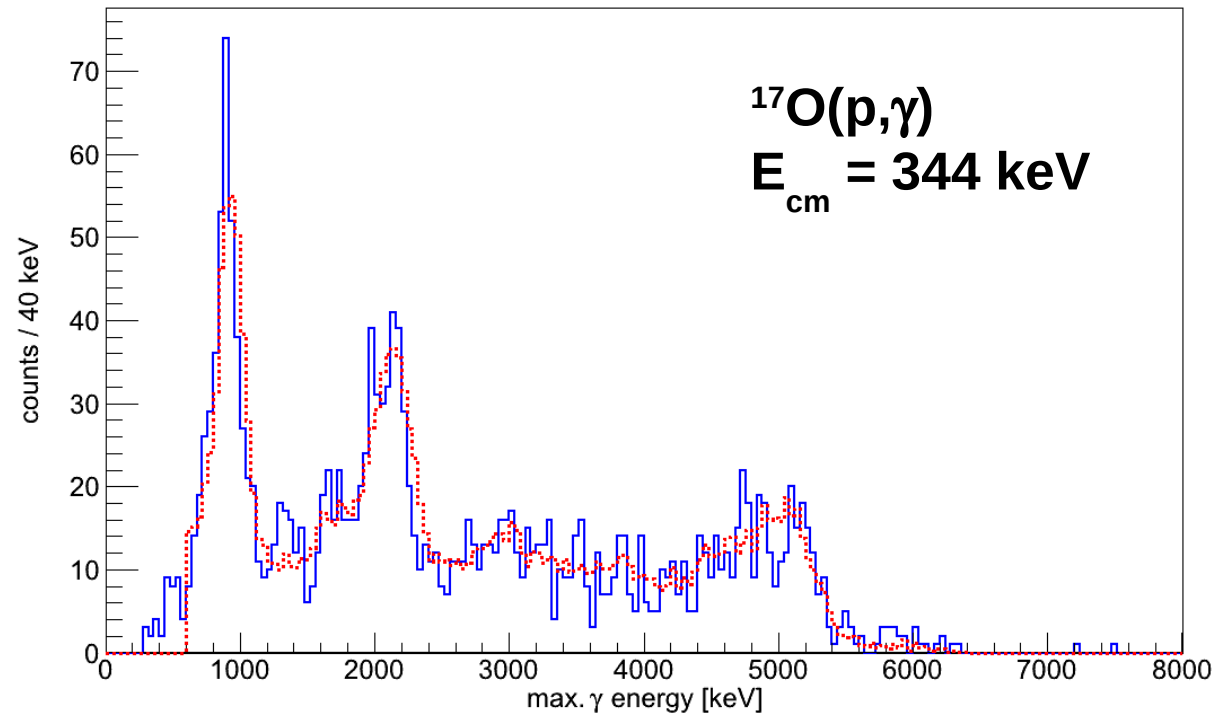
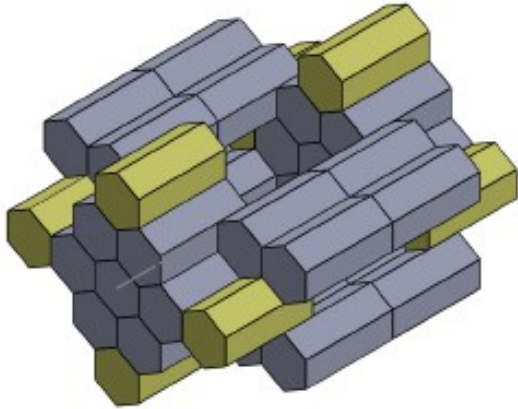


# Scattering monitors in target



- Si PIPS detectors
- Used for normalization
- Need scaler rate
- 6 channels
- Event rates can be high
  - can be pre-scaled if required

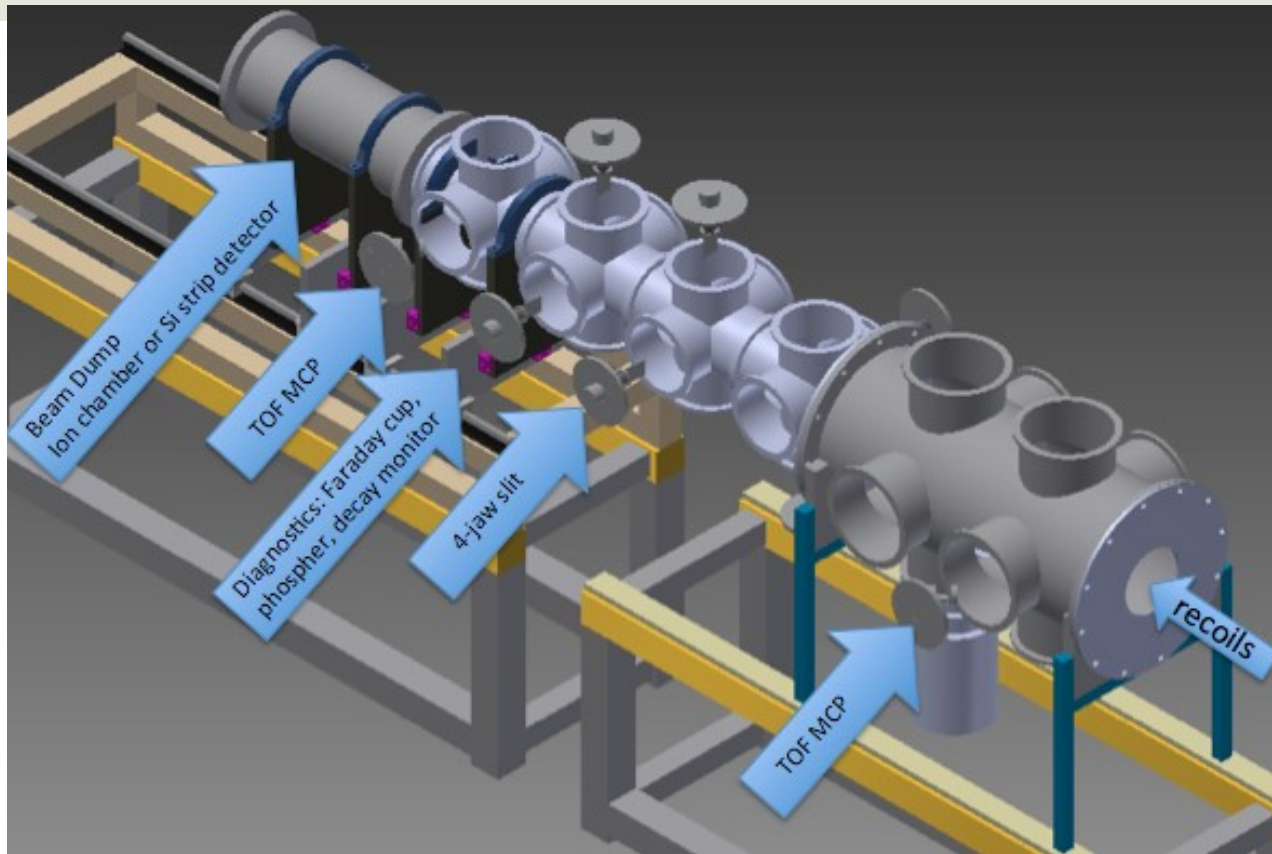
# Gamma array around target



- 30-40 BGOs (plans to upgrade to LaBr)
- Timing and efficiency most important
- Typical rates: several 1000/s in whole array



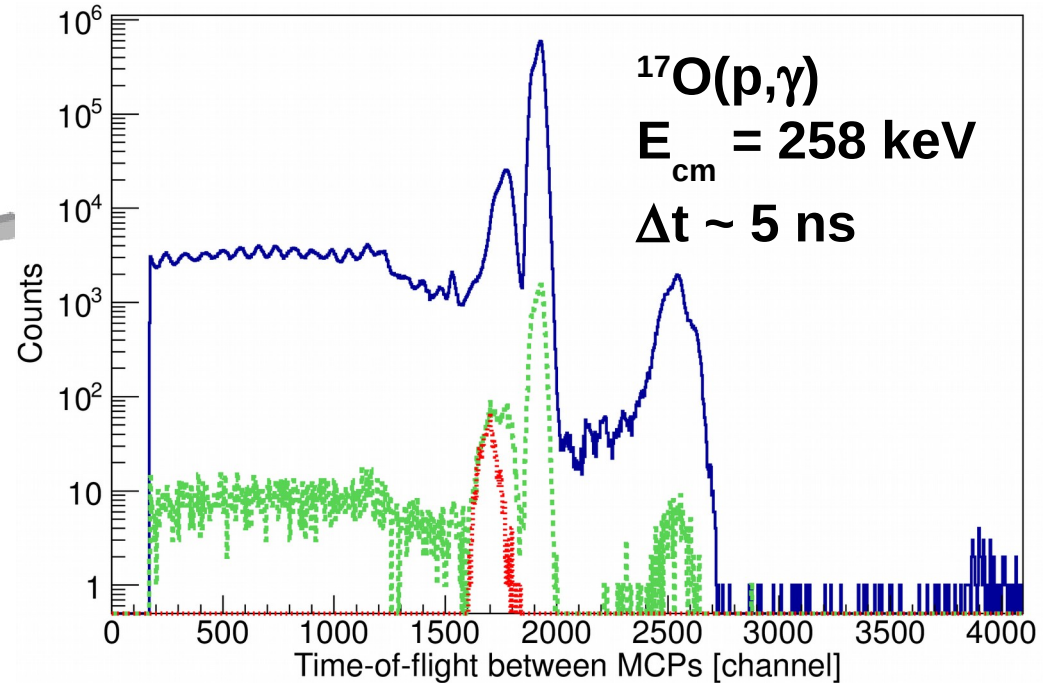
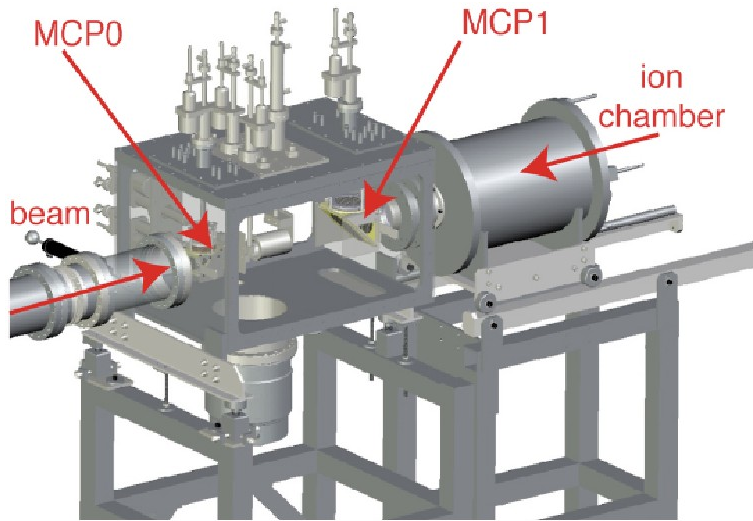
# Focal plane



- 2 MCPs
- Ionization chamber
- DSSSD

- Flexible design to accommodate different experiments
- Typical rates: up to a few 1000/s arriving at focal plane
- 75 channels total planned

# Focal plane time-of-flight



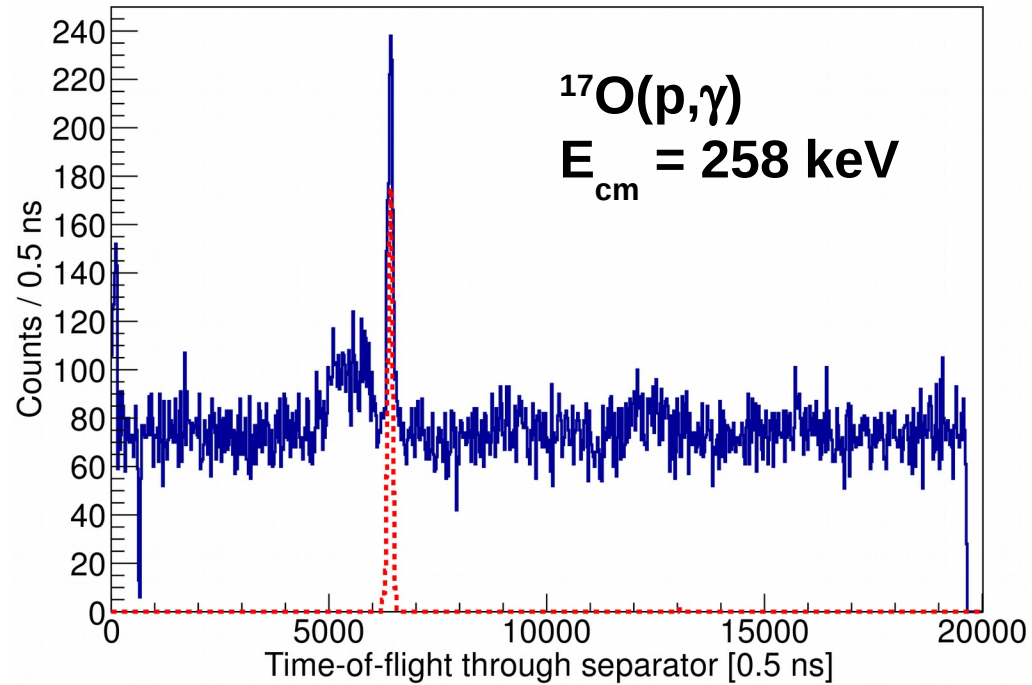
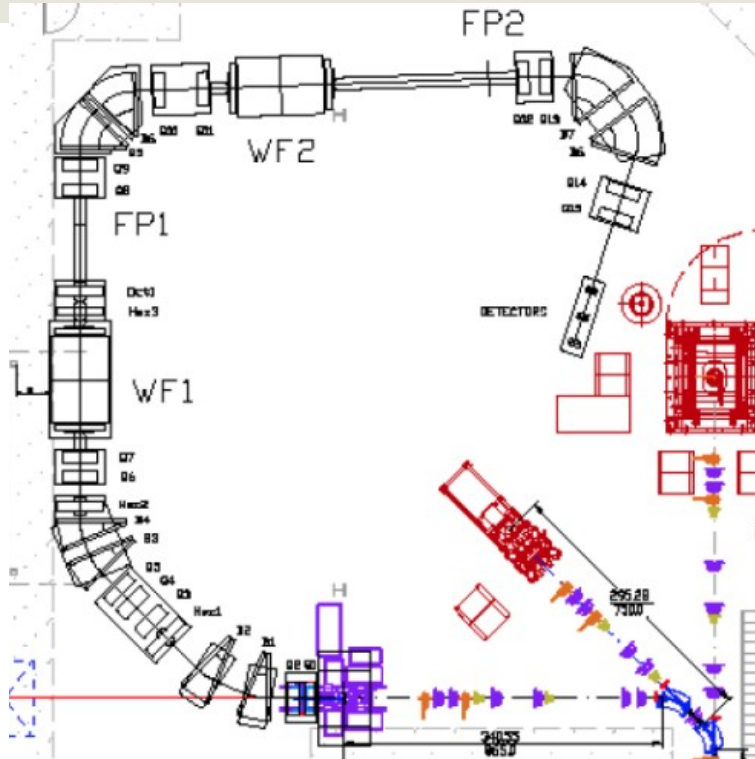
## DRAGON:

- Ortec 9327 1-GHz Amplifier and Timing Discriminator + Ortec 567 TAC
- Typical resolution of 400 ps

## SECAR:

- Distance between MCPs about 2m
- TOF difference for  $^{65}\text{As}(p,\gamma)$  : 1.3 ns

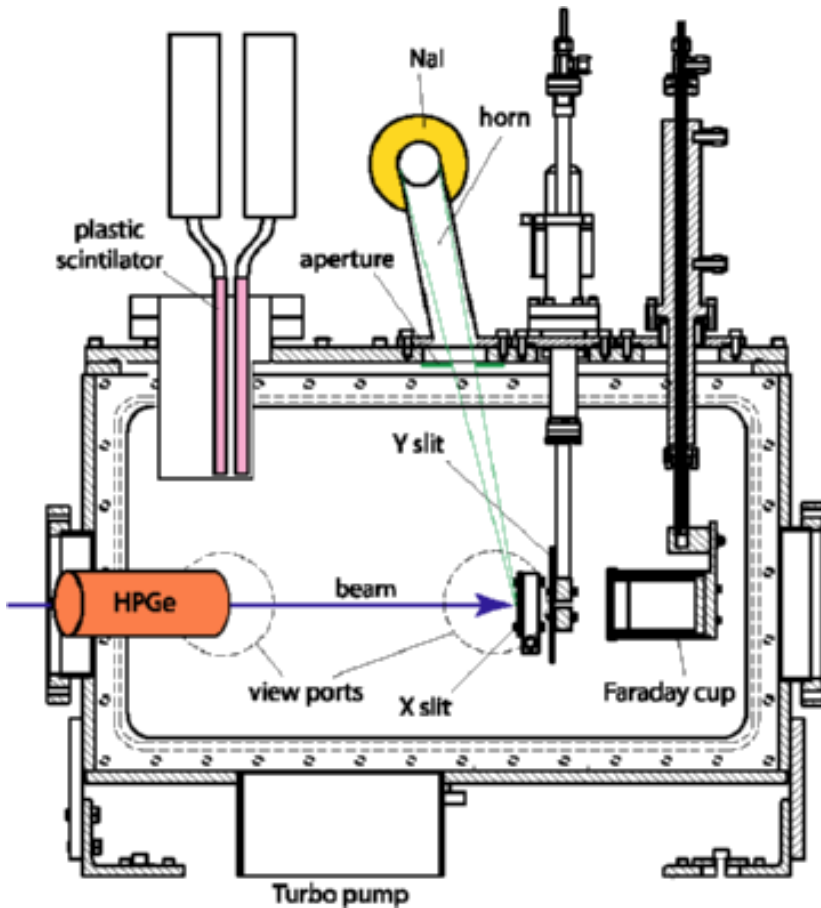
# Separator time-of-flight / coincidence



- DRAGON separator length: 21 m
  - Trigger signal is sent via long cables
- SECAR separator lengths: 41 m
- Typical flight time: around 3-8  $\mu\text{s}$
- Timing resolution of  $\sim 100 \text{ ns}$  required



# Beam monitors



- Monitor decay of beam implanted in slits
- Possible detectors:
  - Ge
  - NaI
  - CsI
- 16 channels
- Trigger independent from rest

# Summary

- Provide DAQ system for:
  - Focal plane systems
  - Beam diagnostics
  - $\gamma$ -array and elastic scattering monitors
- Number of channels
  - Focal plane: 75
  - Elastic scattering monitors: 6
  - Beam diagnostics, contamination monitors: 16
  - $\gamma$ -array: 40
- Requirements:
  - Independent triggers for  $\gamma$ -array and focal plane
  - Time-stamped events that allow coincidence matching / TOF
  - Versatility to accommodate different experimental situations
  - High data throughput (kHz event rates)