Recoil Separators

Manoel Couder
University of Notre Dame
St. GEORGE @ ND

- Designed for $(\alpha,\gamma)$ radiative capture in inverse kinematics
- High beam intensity
  - 5U Pelletron accelerator
- HIPPO gas jet target
- Under commissioning
  - Transport (now)
  - Energy Acceptance (now)
  - Angular (+energy) acceptance
St. GEORGE Commissioning

Diagnostic elements:
- **FC**: faraday cup
- **Q**: quartz-viewer
- **S**: slits

5U beams tested:
- $^1\text{H}^+$, 1MeV
- $^4\text{He}^+$, 1MeV
- $^{16}\text{O}^{2+}$, 2MeV

Quantities measured:
- transmission past WF
- energy acceptance past B5

from Zach Meisel
St. GEORGE First Lessons

- Too much diagnostic is better than not enough
- Even with a pencil beam use proper size diagnostic
- Quality of beam tuning on target is crucial
St. GEORGE First Experiment

- Commissioning experiment + extension at lower energies $^{14}\text{N}+\alpha$
- First step in of chain of reaction producing $^{22}\text{Ne}$
**Step 1:** Dipoles Charge state selection

**Step 2:** Velocity Filter Mass resolution 510

**Step 3:** Velocity Filter Mass resolution 770

**Step 4:** Dipole Cleanup scattered beam

**Step 5:** Focal Plane Detectors WBS SECAR.4.04

**Step 5:** Gamma Detectors WBS SECAR.4.02

Gas target (H, He)

"Scattered Beam"

- Coupled to ReA3
- To get beam from NSCL and later FRIB
  - \((p,\gamma)\) and \((\alpha,\gamma)\) reaction studies \((A<65)\)
  - Mostly focused on resonance strength measurement (can not do it alone)
SECAR Status

• Funded!
  – Project started March 1st

• Collaboration is open

• JENSA exists and is running
  – commissioning + experiment
  – both (α, p)

• Magnets and Wien filters are specified and bids packages are being analyzed

• Diagnostic and focal plane detector work is starting
On a totally different note ...

“...If you have a problem, if no one else can help, and if you can find them, maybe you can hire the A-Team.”