

Experiment 05038

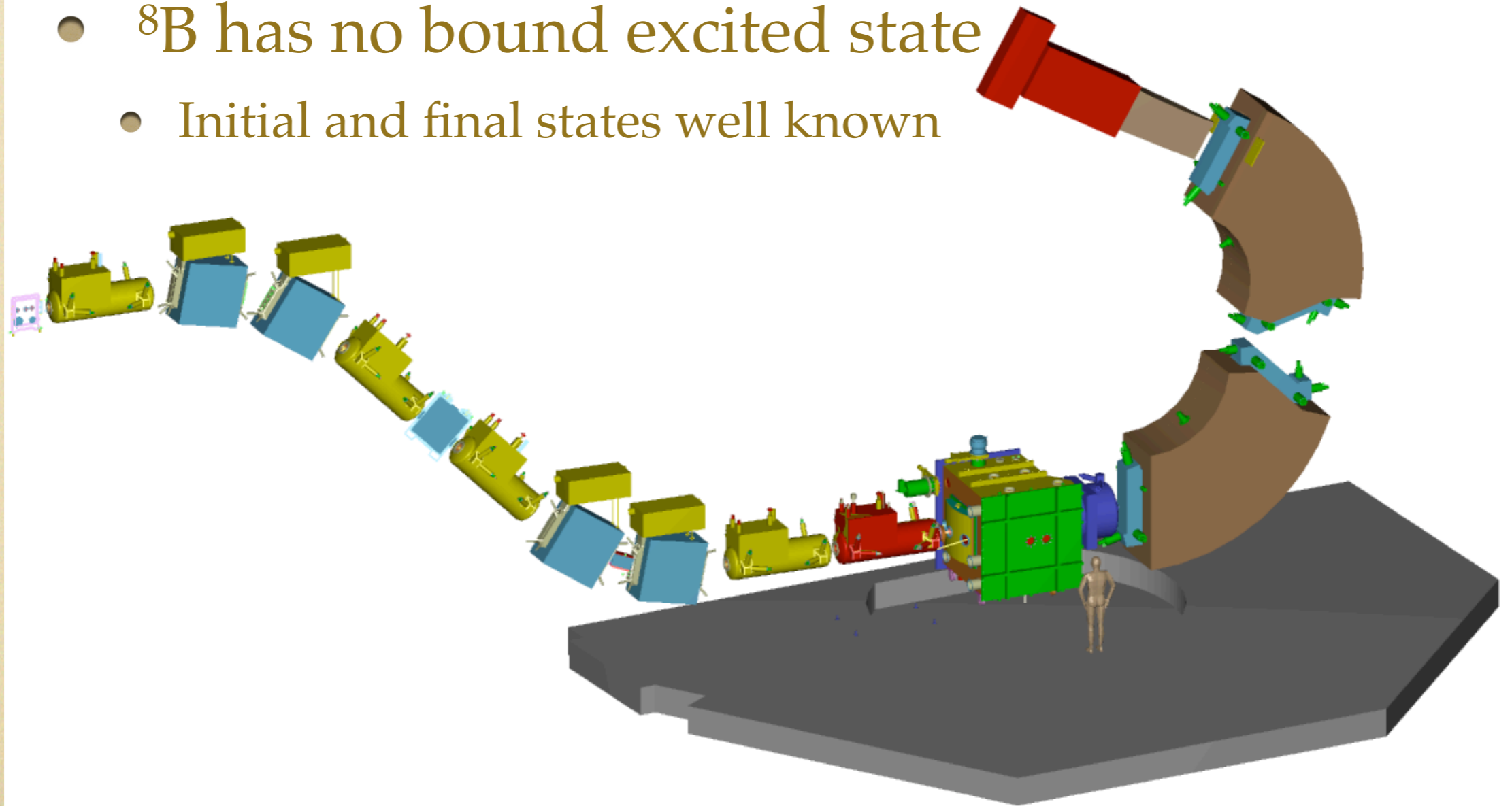
Study of the diffractive component
in the one-proton knockout of ${}^9\text{C}$

Goals of the experiment

- Knockout reactions: sudden removal of one or two nucleons from the projectile by a light target (^9Be)
 - Direct reaction
 - Two reaction mechanisms
 - Stripping: removed nucleon interacts with target
 - Diffraction: removed nucleon elastically scattered
 - In most experiments, only the heavy residue is detected
 - Relative contributions of each mechanism unknown experimentally
- Detect removed proton in ^9C one-proton knockout reactions to single out diffraction

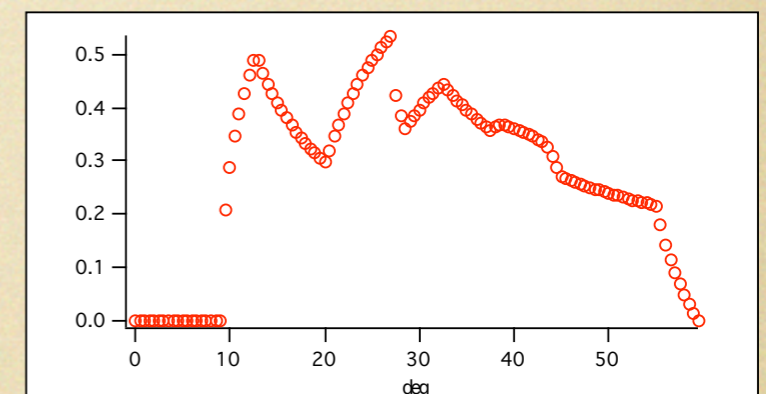
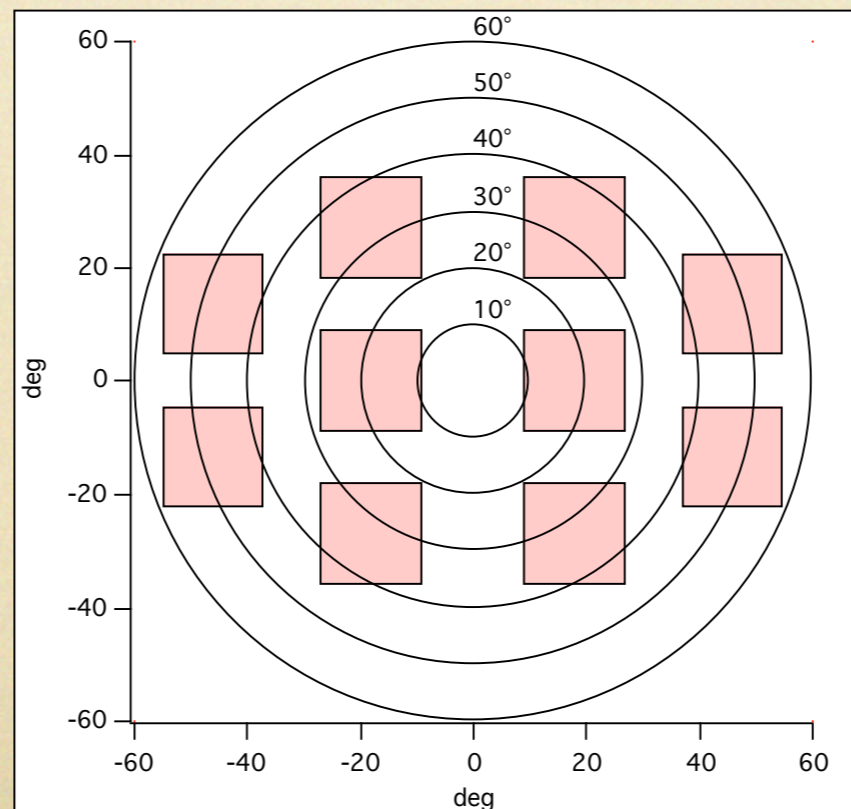
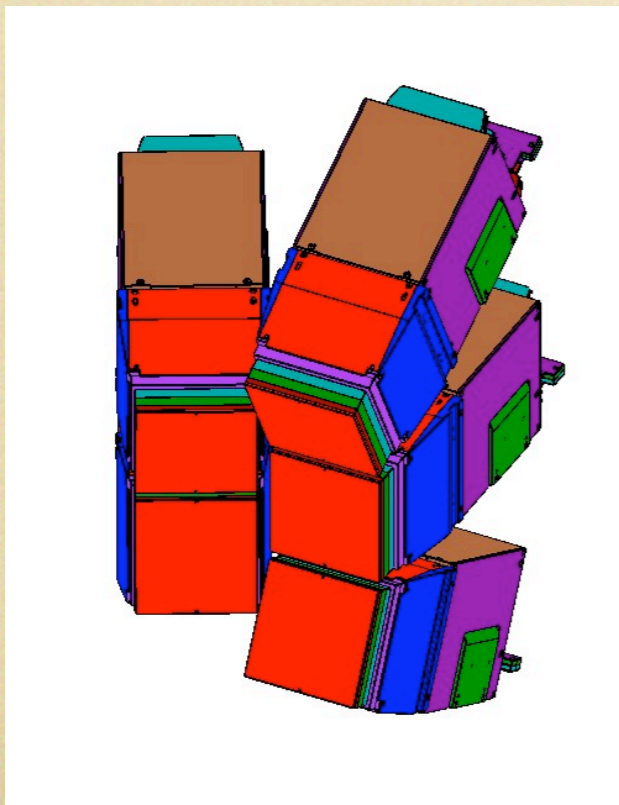
Experimental setup

- S800 + HiRA
 - S800 to detect ^8B residue
 - HiRA to detect proton in coincidence
- ^8B has no bound excited state
 - Initial and final states well known



HiRA setup

- 10 telescopes at 17 cm from target covering between 10° and 60° in the lab
- Detect high energy protons (100 MeV)
 - No ΔE detectors
 - Energy loss in E detectors: 2 MeV
 - Punch-through energy for CsI: 110 MeV





Run program

- Expected rates
 - Radioactive ${}^9\text{C}$ produced from $150 \text{ MeV/u } {}^{16}\text{O}$
 - Incoming rate $2000 {}^9\text{C} / \text{s/pnA}$
 - Cross sections 40 mb stripping 14 mb diffraction
 - About 10 S800+HiRA coincidences per second
- Three $B\rho$ values to cover ${}^8\text{B}$ parallel momentum

