

E12-11-112

${}^3\text{He}/{}^3\text{H}$   $X > 1$

Patricia Solvignon

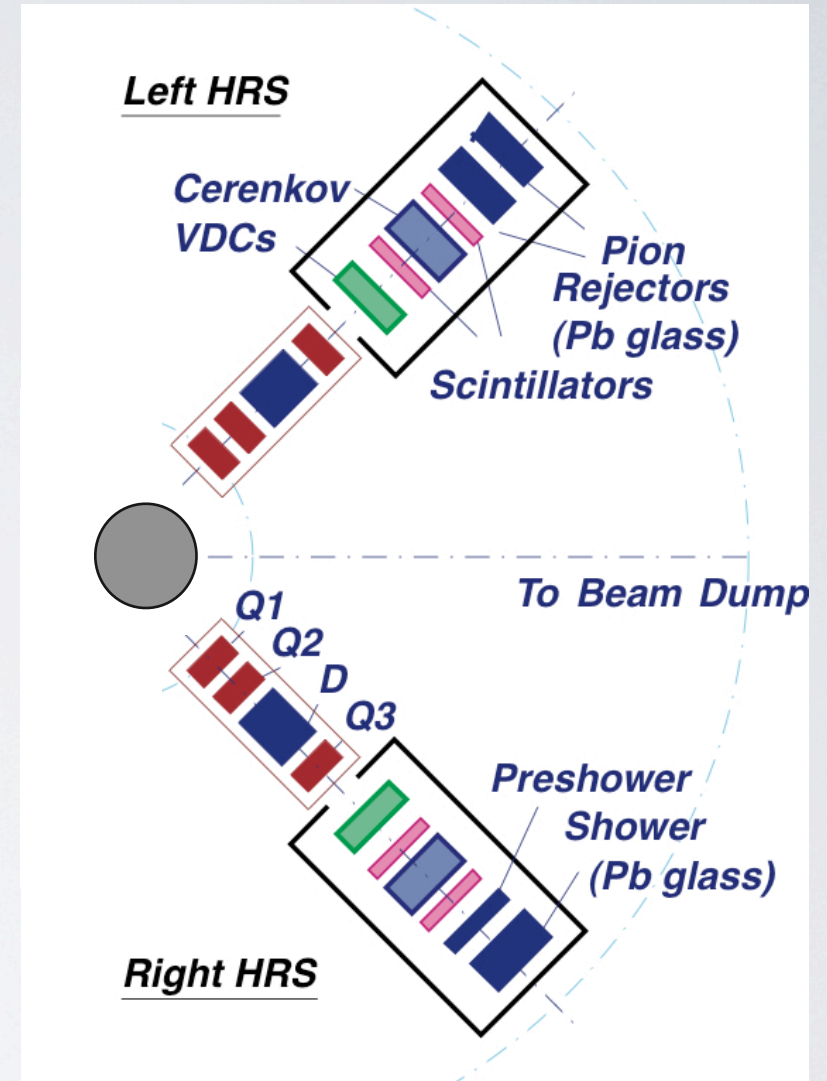
Jefferson Laboratory

Spokepeople: John Arrington (ANL), Donal Day (UVa),  
Doug Higinbotham (JLab), Patricia Solvignon (JLab)

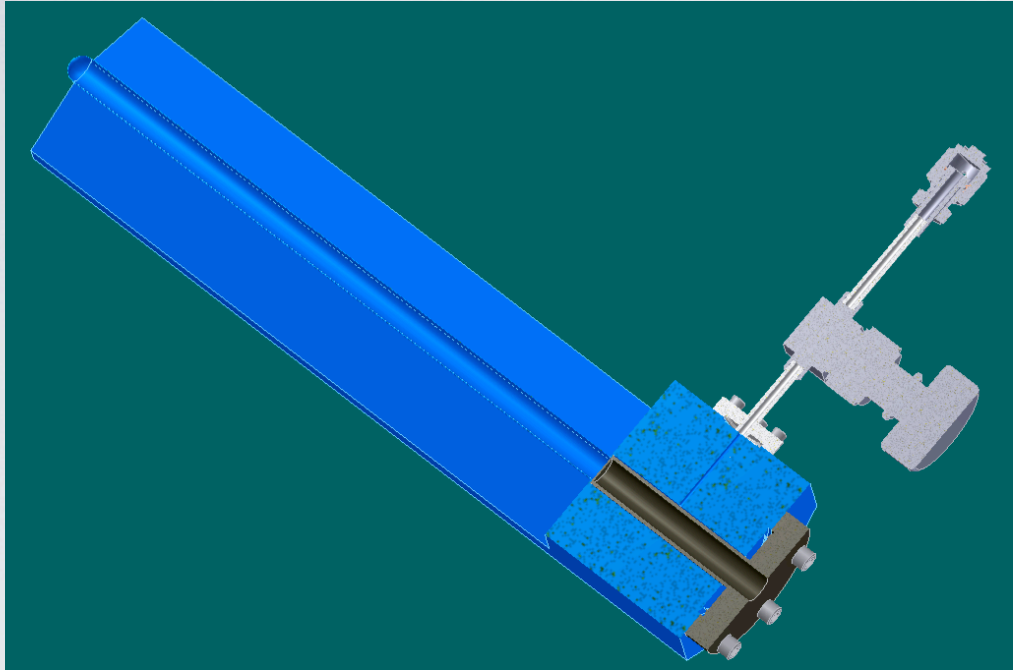
Hall A Collaboration Meeting  
December 15-16, 2011

# PR12-11-112: EXPERIMENTAL SETUP

- ❖ Standard Hall A HRS configuration
- ❖  $^1\text{H}$ ,  $^2\text{H}$ ,  $^3\text{H}$ ,  $^3\text{He}$  room temperature cells, 20 atmospheres (10 for  $^3\text{H}$ )
- ❖ Empty stainless steel cell for window subtraction (used to check software cut on windows)
- ❖ Carbon foils for optics
- ❖ Gas Cerenkov + Calorimeter PID

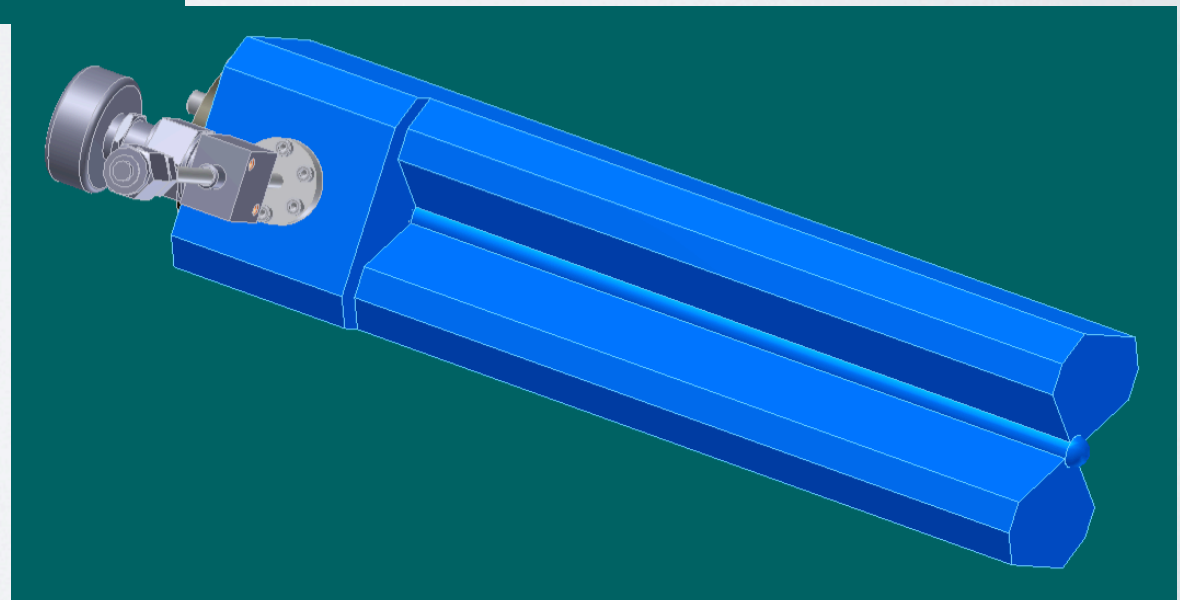


# TRITIUM TARGET: UPDATED DESIGN



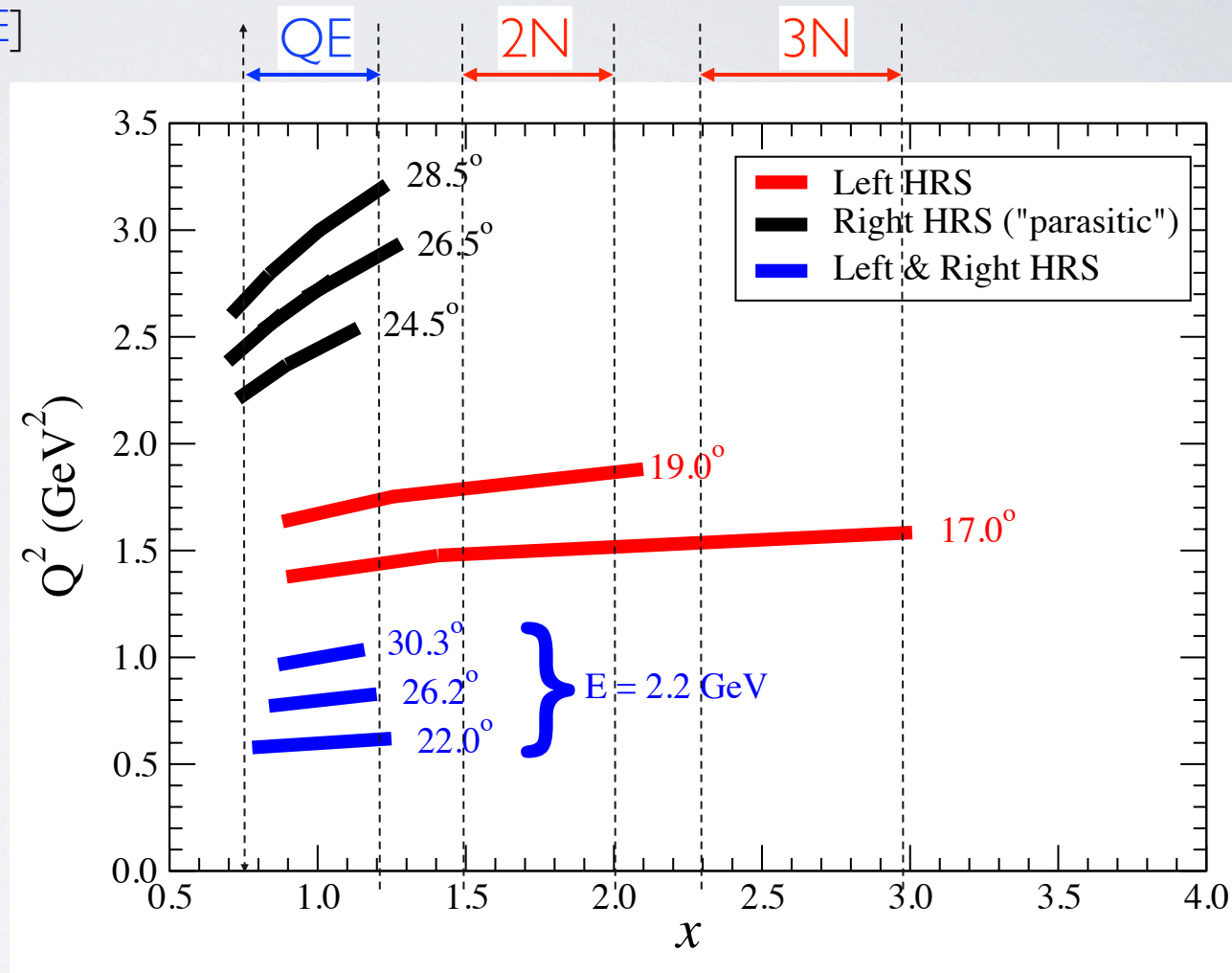
- Four identical cells:  $^1\text{H}$ ,  $^2\text{H}$ ,  $^3\text{He}$  at 20 atmospheres,  $^3\text{H}$  at 10 atm.
- Operate at room temperature
- Length: 25cm, Diameter: 1.25cm
- 18 mils walls and 10 mils windows

- Prototype under fabrication
- Goal is to be ready during FY15 if funding and resources start soon.



# KINEMATIC COVERAGE

- Beam current: 25  $\mu\text{A}$ , unpolarized
  - Raster interlock
- Beam energy: 4.4, (2.2) GeV
  - 17.5 Days 4.4 GeV [main production]
  - 1.5 days 2.2 GeV [checkout+QE]



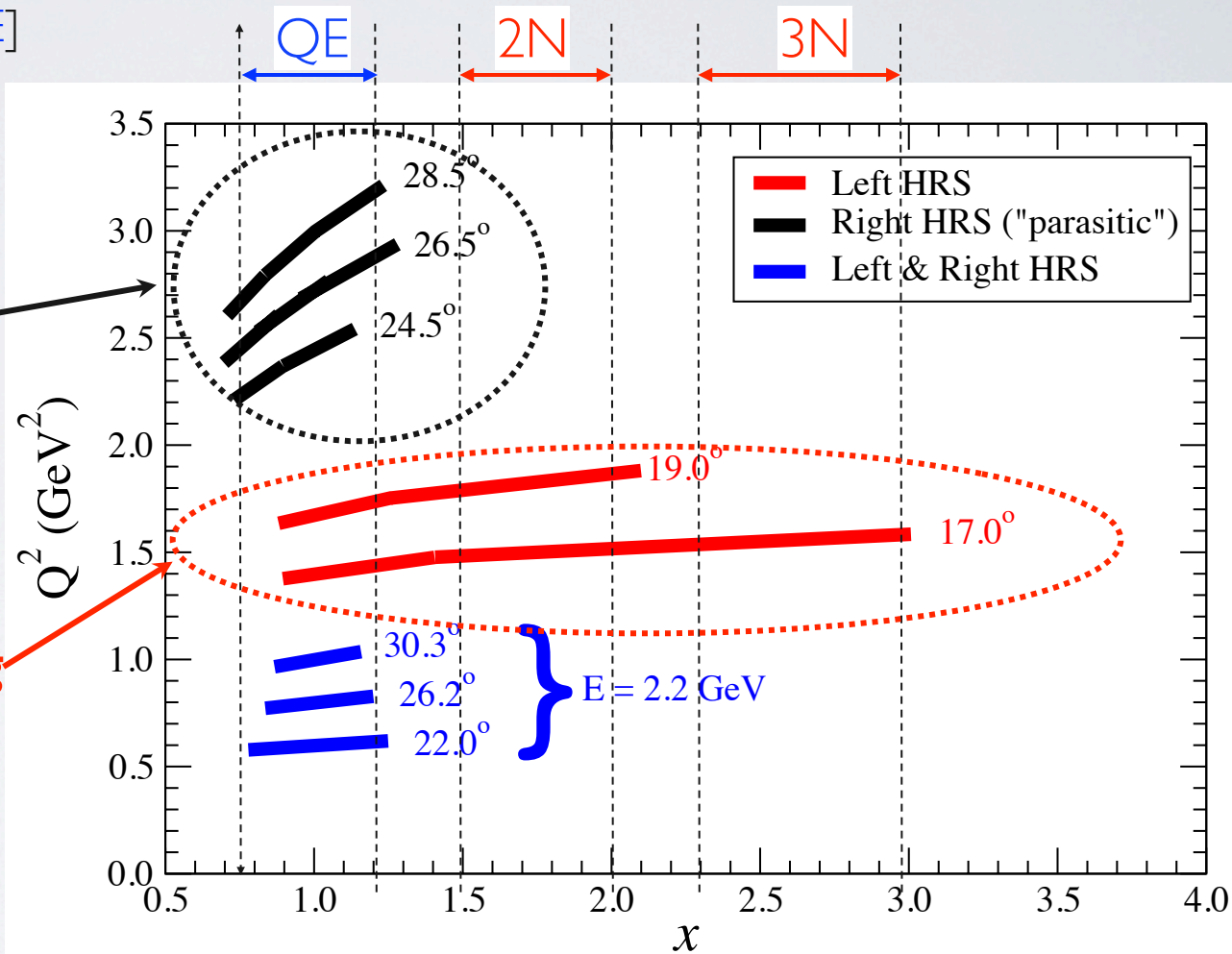
# KINEMATIC COVERAGE

- Beam current: 25  $\mu\text{A}$ , unpolarized
  - Raster interlock
- Beam energy: 4.4, (2.2) GeV
  - 17.5 Days 4.4 GeV [main production]
  - 1.5 days 2.2 GeV [checkout+QE]

**Right HRS running  
("parasitic")**

Existing 3H QE data  
limited  $Q^2 \leq 0.9 \text{ GeV}^2$

**Left HRS running  
(380 hours)**



# SUMMARY

- **Study of isospin dependence of 2N-SRC from  $^3\text{H}/^3\text{He}$  from inclusive scattering: will complement the results of 2N knockout experiments**
  - Greater precision
  - Smaller final-state interactions
- **First look at isospin-momentum structure in 3N-SRC region**
- **Quasi-elastic data on  $^3\text{H}$  and  $^3\text{He}$  for  $Q^2$ -values of 0.6-3.0 (GeV/c)<sup>2</sup>**
- **Beam time requested: 19 days productions data including time for calibrations, background studies and configuration changes**
- **Hall A spectrometers in standard configuration, same  $^3\text{H}$  target system needed for the approved MARATHON experiment (E12-10-103)**
- **If approved, would run together with MARATHON**
  - Possibly in first few years of running
  - Goal is to have target ready during FY15