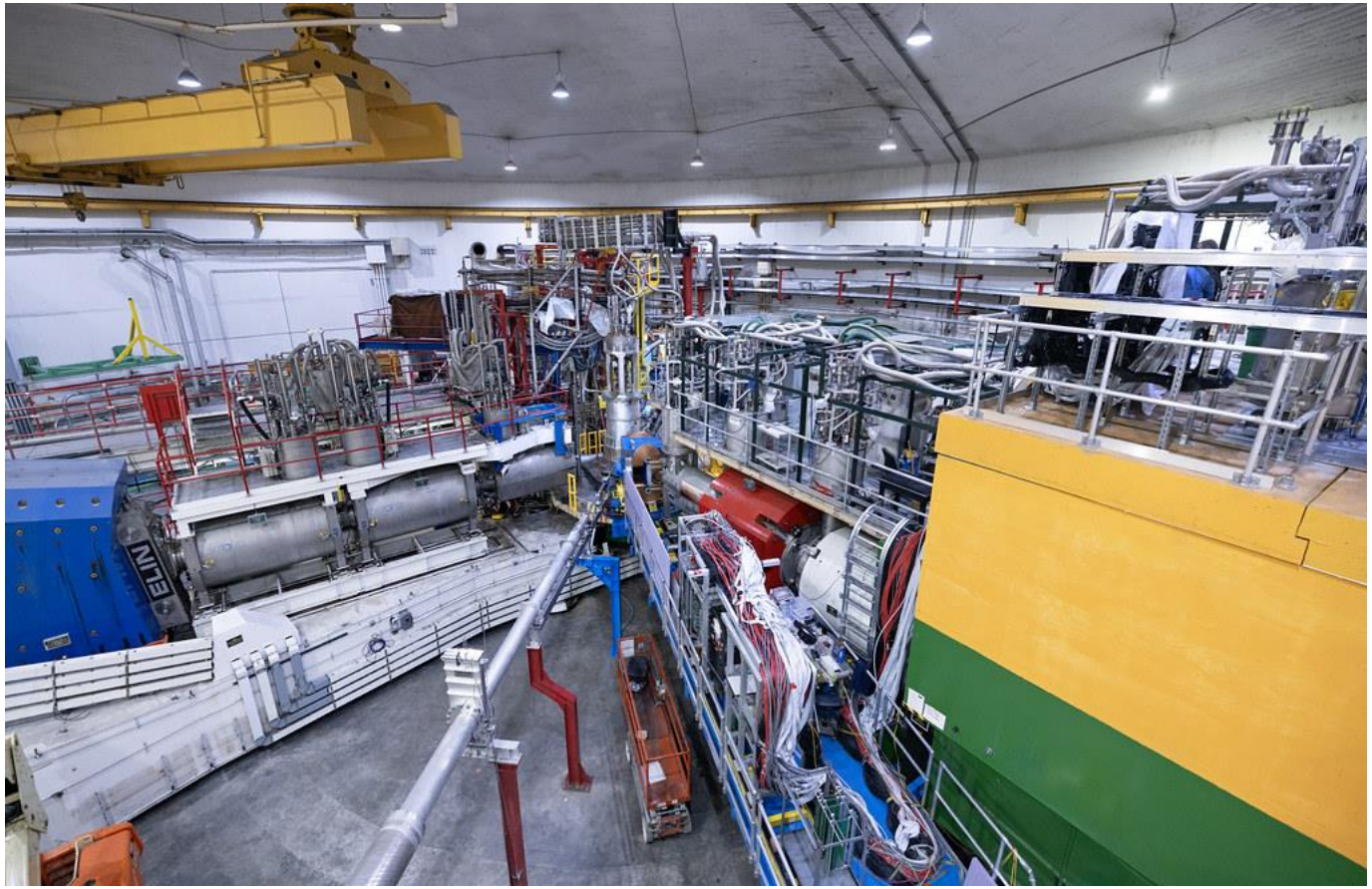

NPS hardware paper

discussion

C. Muñoz Camacho

NPS Collaboration Meeting

JLab, May 5-6 (2025)

Possible outline

1. Introduction
- Scientific motivation
- Role of the NPS in the broader JLab physics program

2. Physics Requirements and Detector Concept
- Overview of experiments requiring the NPS
- Performance requirements: energy, time, position resolutions, acceptance
- Design concept and rationale

3. Detector Design
- Design overview
- NPS Magnet
  - Design, simulations
- NPS Calorimeter
  - PWO crystals and wrapping
  - PMTs and optical coupling
  - LED monitoring
  - Cooling system
  - Support frame

4. Readout Electronics
- Front-end electronics (eg. PMT active base design)
- Trigger system
- F250s and integration into Hall C DAQ

5. Calibration
- Cosmic rays calibration
- Elastic calibration
- π^0 calibration

6. Simulations and Performance Studies
- GEANT4 and SIMC simulations
- Background and radiation dose studies

7. Installation and integration in Hall C
- Installation overview
- Shielding and radiation considerations
- Survey and alignment

8. Commissioning and detector performance
- Stability, reliability, and maintenance
- Energy, position, time resolutions
- DAQ rates and livetime
- Radiation hardness
- Lessons learned

9. Conclusion and Future Work
- Summary of achievements
- Future physics program
- Upgrades/refurbishment ?

Target journal

- NIM A
- JINST
- EPJ A (?)

Timeline

- With a significant commitment of need people, I'd estimate the drafting to ~ 4-6 months
- Timeline will depend on when we start (t_0), and whether t_0 is the same for everyone

Sample timeline:

- Initial drafting of each section (text) and identification of figures needed (1 month)
- Creation of figures (1 month)
- Final drafting (1 month)
- Review and editing (1 month)

Backup