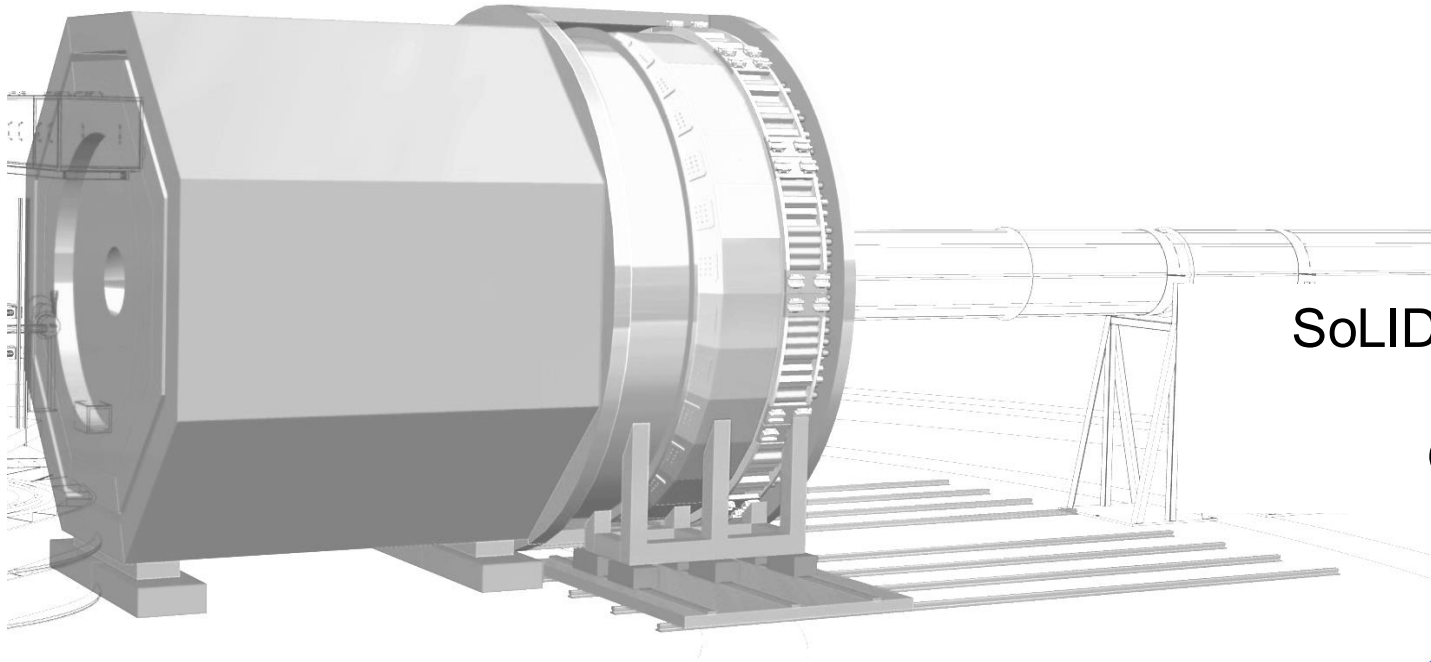


Update on SoLID and SoLID-Lite



SoLID Collaboration Meeting
@ Jefferson Lab
October 9, 20256

Jian-ping Chen
Jefferson Lab



Outline

1. Recent Developments
2. SoLID-Lite
3. Beam Test and R&D
4. Plan for the Next Steps

Eric/Ching Him's talks

Recent Developments

- SoLID Physics Program: critically significant
- Budget reality: extremely difficult, if not impossible, to fund as a project (~\$100M)
- Looking into cost-effective way to get SoLID physics program done
--> SoLID-Lite
- Beam Test
- R&D with cutting-edge technology, AI/ML
- Inputs to CEBAF2037 planning: High-Lumi Workshop

Budget Reality

- SCAC Facility Subcommittee Prioritize Projects from HENP, BES, BER, FS, ASCR
Total Proposed > \$22B, budget possibilities \$2B, \$4B, \$6B for next decade !

Projects to Be Prioritized — and Why

A document on the SCAC website lists projects under construction and proposed projects. The subcommittee will focus on proposed projects. We are also invited to identify gaps.

OUR CHARGE SUGGESTS:

It may facilitate the work of the advisory committee to consider prioritization in the context of budget opportunities. For example, if either \$2B, \$4B, or \$6B is available for new facilities and upgrades over the next decade, what would be the highest-priority facilities to include?

Total proposed: >\$22B

SoLID-Lite

Can we do significant portion of SoLID physics with a fraction of full cost?
@ a level of typical large scale JLab experiment (~ \$10M)

Staged approach:

Start with J/ψ

Silverster's talk

Then SIDIS 3He

Zhiwen's talk

Then ...

1. Use CLEO magnet as it was for J/ψ , add field clamping for SIDIS, ...

2. Re-use existing detectors

good news: BNL detectors available sPHENEX

STAR Forward Upgrade

ECal: cover more than SoLID needs?

Xiaochao's talk

GEM (checking information)

Vertex Detector: Recoil detector for SoLID?

HCal: muon detection?

TOF: claimed by others?

Others?

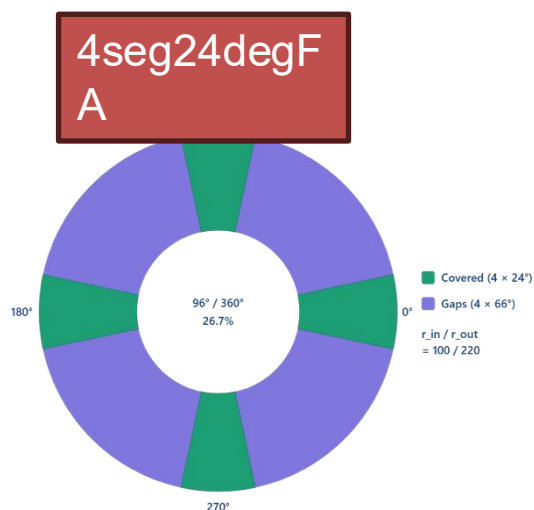
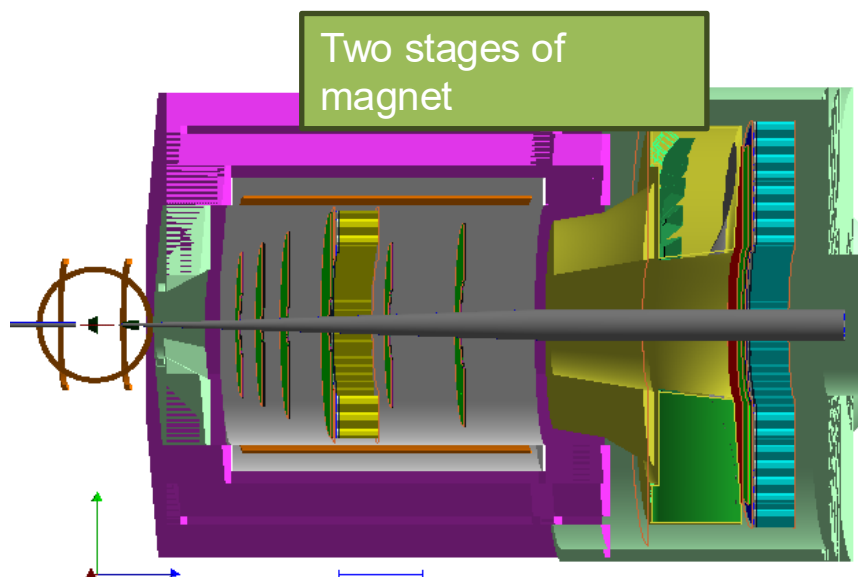
3. Cherenkov: one, Canadian funding \$1M (U. Regina)

4. Initial configuration: large angle region full size, forward region ~ 1/4 size

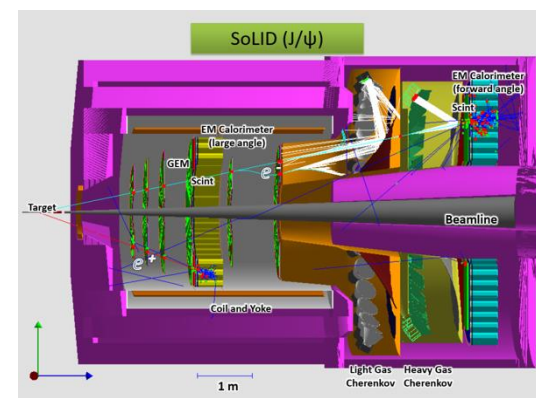
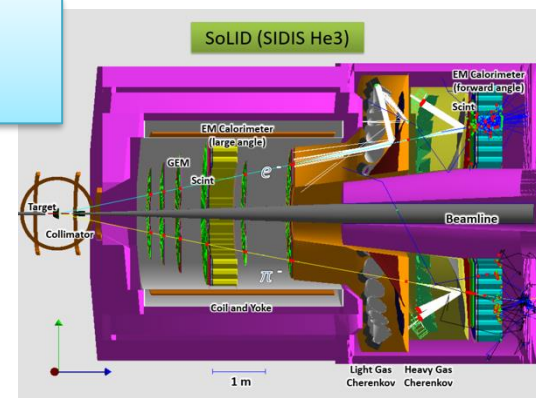
5. Upgradable

SoLID Light option (preliminary)

- SoLID full with forward angle (FA) and large angle (LA) detectors
- SoLID light option (one example “4seg24degFA”)
 - Works for both SIDIS He3 and JPsi
 - Reduce FA into 4 segments of 24 deg each while keeping LA full
 - Solenoid magnet using CLEO iron (purple) without modification for JPsi, then add front piece and endcap (green) for SIDIS, no magnet endcap nose
 - One Cherenkov with CO2, maybe reuse sPHENIX ECAL



SoLID
full



Plan for the Next Steps

- Complete simulations for J/ψ and SIDIS
- Gathering information, discuss with BNL experts
get samples, find out modifications and testing performance
- JLab already started contacting BNL management
plan a trip to BNL to find out which ones are worth and available to bring back to JLab
- Cost exercise, conceptual design, initial engineering
- Simulations, find out physics impacts
→ PAC to review SoLID-Lite experiments
- JLab management discussed with DOE
DOE likes our approach
Suggest using a new name (SoLID associated with proposed DOE project)

New name: please send your suggestions to me (in 1 week)