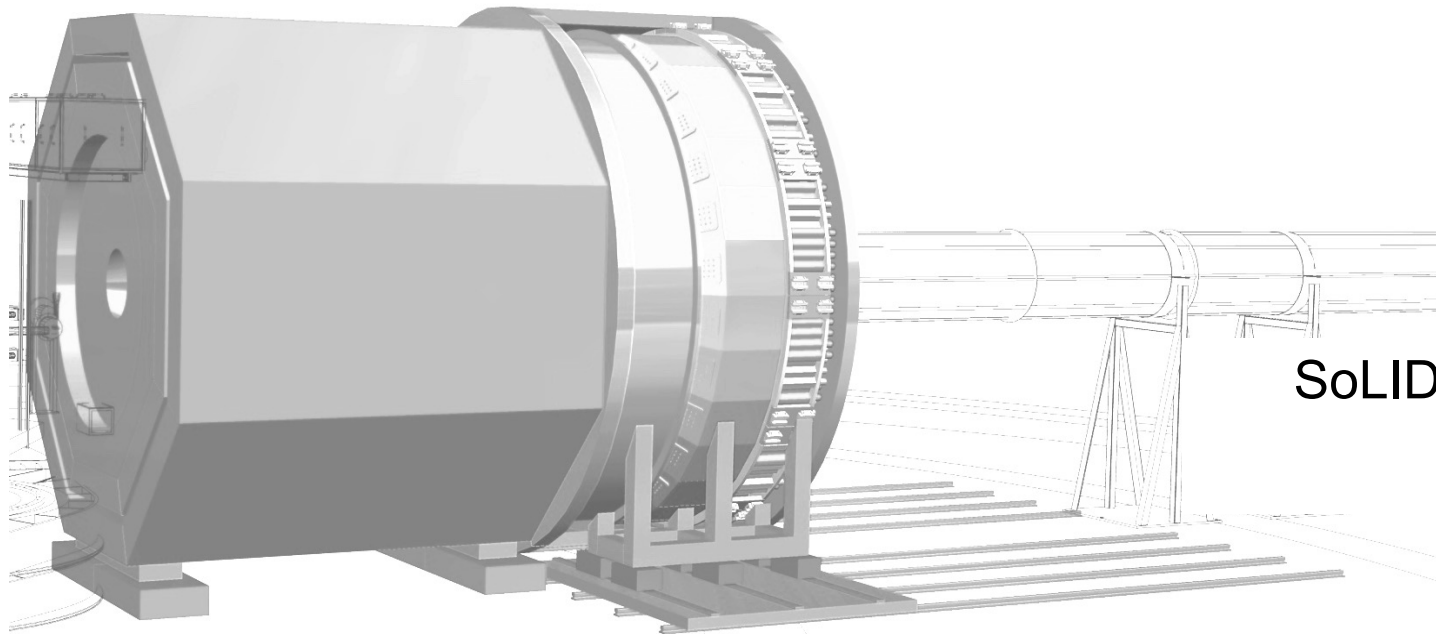


# SoLID Update



SoLID Collaboration Meeting  
Dec 7-8, 2023

Jian-ping Chen  
Jefferson Lab



# Outline

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1. Progress Since May 2023 Collaboration Meeting
2. Recent Development
3. Physics Programs
4. Plan for the Next Steps

# Progress Since May 2023 Collaboration Meeting

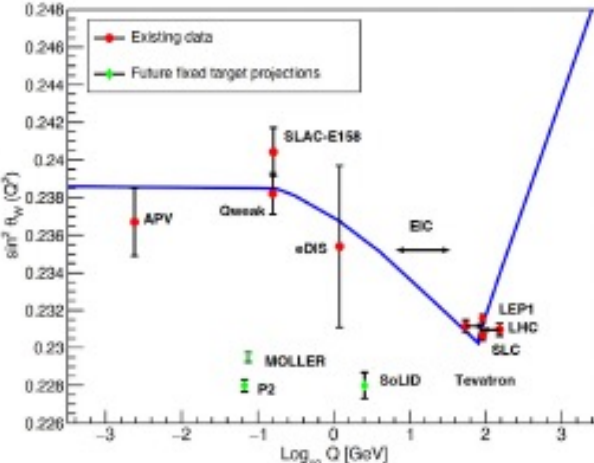
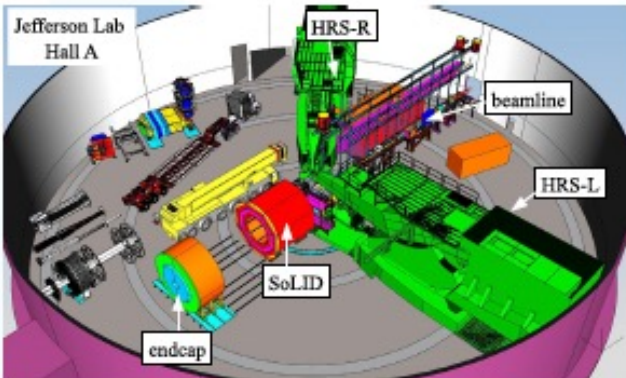
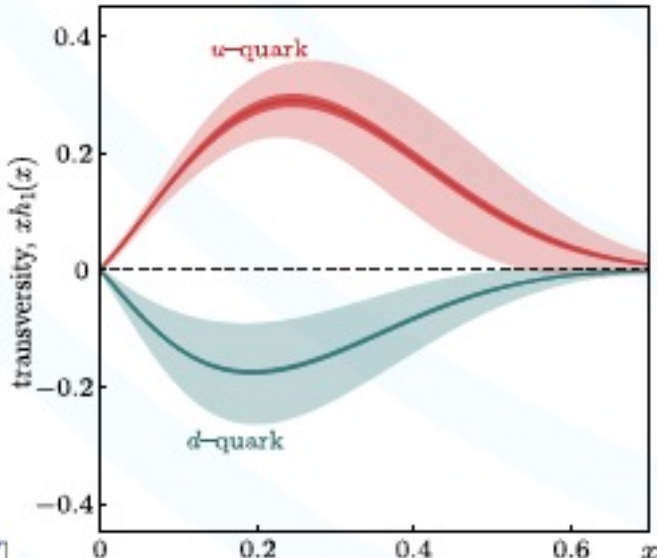
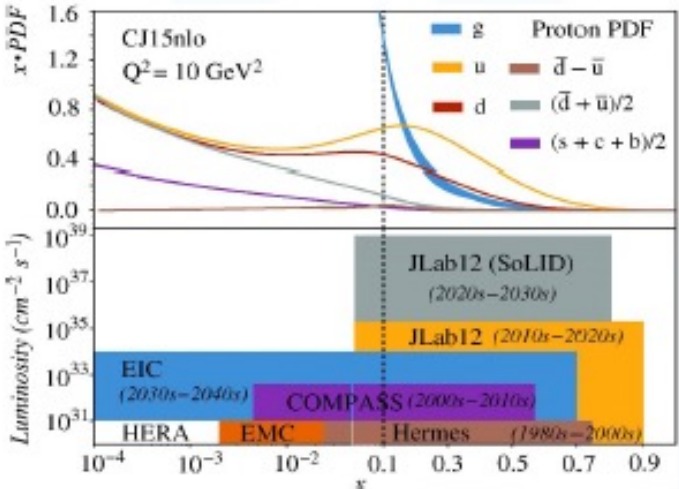
- Project Status
  - Science Review **Feedback: positive report, recommend to move to next step**
  - DOE last year: do well in Long Range Plan, R&D to *reduce risk/cost for SoLID*
  - LRP: SoLID In Recommendation #4, prominently featured in the report.**
  - DOE this year: keep cost down (sPHENIX model) and find a funding path forward.
  - Working on a new budget plan with JLab cost sharing
- Pre-R&D Activities:
  - DOE funded 2<sup>nd</sup> pre-R&D
  - 1. Detector Beam Test in Hall C: analysis near completion (Michael Nycz/Ye Tian)
  - 2. DAQ GEM (VMM) readout test (Alexandre Camsonne)
- Progress in All Subsystems
  - Engineering/Design/Magnet (Whit Seay)
  - Software/Simulation/Tracking (Chao Peng/Ye Tian/Xinzhan Bai)
  - ECal (Micahel Nycz)
  - GEM (Nilanga Liyanage)
  - LGC (Michael Paolone)
  - HGC (Zhiwen Zhao)
  - Detector (ECal/MRPC) R&D from China Side (Zhihong Ye)
- Physics: **Rich Vibrant Programs**, new development continues
- Collaboration: **Active**, continue growing

# Recent Development I: Long Range Plan

❖ SoLID in Recommendation #4:

*“We recommend capitalizing on the unique ways in which nuclear physics can advance discovery science and applications for society by investing in additional projects and new strategic opportunities”... which include “the Solenoidal Large Intensity Device (SoLID) at Jefferson Lab”.*

❖ SoLID prominently featured in the report:



# Recent Development II: Cost (Sharing) Plan

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- ❖ DOE Discussion with Jlab (earlier this year)
  - Keep cost low with "sPHENIX model"
- ❖ SoLID Collaboration working with Jlab/Physics Division/Hall A on cost sharing plan
  - Part of Division capital fund for DAQ and detectors
  - Part of Hall A operation fund for magnet testing and generic infrastructure
- ❖ Cost Sharing Plan
  - Updated cost estimation from last one (2019) to 2023
  - Looked into various options
  - Working on details on the cost sharing plan
- ❖ Timeline
  - 12/2023 Cost sharing plan and update (addendum) to pCDR
  - 1/2024 JLab management visit DOE, discuss the new plan/feedback
  - 2/2024 February lab budget briefing

# SoLID Total Cost: New Proposed Cost Sharing Plan

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2019 cost estimation	82.4 M
2023 cost estimation	94.5 M
Possible cost reductions:	
JLab cost sharing:	28.1 M
New SoLID Project budget request (TEC)	63.4 M

# SoLID Physics Programs

- Rich and Vibrant Physics Programs with SoLID
  - 6 approved proposals (5 A, 1 A-): 3 SIDIS, 1 J/psi, 1 PVDIS, 1 BNSSA
  - 1 Conditionally Approved Proposal: PVEMC
  - 6 Run-group proposals
  - LOIs (DDVCS, PVDIS-pol3He, Tensor b1, Tensor Azz (Elena Long))
  - Others: SIDIS cross sections (run-group)
    - N-Delta (LOI)
    - DVCS with polarized target (proposals under development)
    - Tensor SIDIS (Nathaly Santiesteban)
    - u-channel SIDIS (Bill Li)
  - .....
- SoLID Whitepaper (published)
- SoLID@JLab22 (whitepaper published)
- Theoretical development
  - Near-threshold J/psi production: Probe Gravitation FF (Yuxun Guo)
  - .....

# Plan for the Next Steps

- SoLID Collaboration Work with JLab, DOE/ONP to Move SoLID Forward
  - Complete the new budget plan
  - Complete the update (addendum) to the pCDR (All)
  - Provide details on the plan for the DOE presentation/Budget Briefing
- Plan and Preparation
  - Magnet testing, infrastructure and engineering/design (Whit Seay)
  - Capital Project I GEM (Nilanga Liyanage)
  - Capital Project II LGC (Michael Paolone)
- On-going pre-R&D Activities
  - DAQ and GEM readout (Alexandre Camsonne)
  - Complete analysis of detector beam test data (Mike Nycz)
  - Comparison with simulation, verify/refine the design (Ye Tian)
  - Tracking development (Xinzhan Bai)
- Other Development
  - Software, synergy with EIC software development (Chao Peng)
  - ECal and MRPC (Zhihong Ye)
  - HGC (Zhiwen Zhao)
  - R&D on LAPPT (Simona Malace)
  - Mirror coating (Bill Li)

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