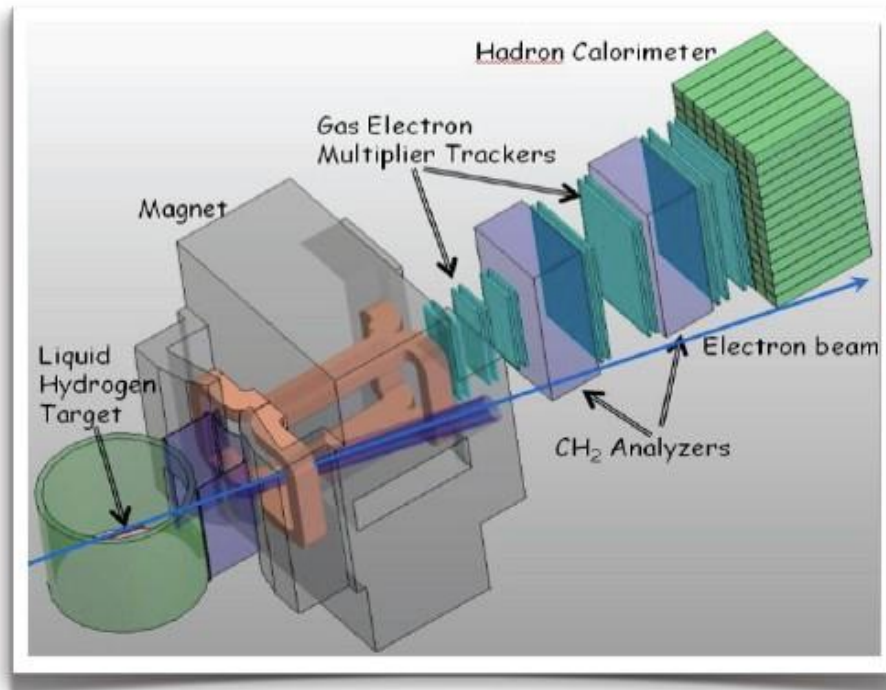


Super-BigBite-Spectrometer (SBS)

Monthly Progress Report

July 15, 2013



Introduction:

The SBS Program consists of three separate, but interrelated Projects.

- The first Project, **SBS Basic (WBS 1)**, involves the acquisition of an existing magnet and the associated work of preparing it for use during the SBS research program. The effort includes modifications to the magnet, including machining a slot in the yoke for beam passage, field clamps, and a solenoid to reduce the transverse magnetic field on the beam line, the design and development of the infrastructure needed to run the magnet, and the construction of the platform on which it will stand.
- The second Project, **Neutron Form Factor (WBS 2)**, involves the construction of twenty-nine GEM detector modules with associated front-end and DAQ modules to meet the requirements of the approved neutron form factor measurements.
- The third and final Project, **Proton Form Factor (WBS 3)**, involves the construction of thirty-five GEM detector modules with associated front-end and DAQ modules and the addition of pole shims for increased magnetic field integral to meet the requirements of the approved proton form factor measurements.

Project Management Highlights:

This is the tenth Monthly Progress Report for the SBS Program. The collaboration is in place, and the Program Management Plan has been approved by Jefferson Lab management and by the DOE-NP Instrumentation Program Manager.

The first and second Projects within the SBS Program, SBS Basic (WBS 1) and Neutron Form Factor (WBS 2), started at the beginning of FY13.

Level 3 milestones for WBS 1 to allow better tracking on a quarterly basis have been established. Similar milestones are being developed for WBS 2 and WBS 3. When a complete set of level 3 milestones for all three WBS's are ready, the PMP will be updated to include them and it will be submitted for formal approval.

The third Project, Proton Form Factor (WBS 3), isn't scheduled to start until FY14.

WBS 1: SBS Basic

WBS 1	SBS Basic: (Hall A Infrastructure)	WBS 1.01	Milestones
		WBS 1.02	Project Oversight
		WBS 1.1	Magnet, power and construction
		WBS 1.2	Magnet/detector platforms
		WBS 1.3	Beam line

WBS 1.01 Milestones:

Id #	Level	Milestone	Scheduled Date	Expected Date 6/1/2013	Expected Date 7/1/2013	Actual Date
1.1-01M	1	Project start	10/1/2012	10/1/2012	10/1/2012	10/1/2012
1.2-01M	2	Magnet delivered to JLab	4/30/2013	6/30/2013	7/30/2013	
1.2-10M	2	Platform parts received	6/27/2014	6/27/2014	6/27/2014	
1.2-20M	2	Magnet assembled on platform	3/19/2015	3/19/2015	3/19/2015	
1.2-30M	2	Beam-line parts received	9/24/2015	9/24/2015	9/24/2015	
1.1-10M	1	Project completion	1/29/2016	1/29/2016	1/29/2016	

WBS 1.02 Project Oversight:

- SBS weekly meetings, held via tele and video conference were limited in June due to conflicts with the SBS Collaboration meeting on June 4-5, the Hall A Collaboration meeting on June 13-14, and the Program Advisory Committee Meeting on June 17-20. During this Report period, only one meeting was held on June 19th. Participants included Jefferson Lab, University of Virginia, University of Massachusetts, Carnegie-Mellon University, University of Connecticut, and Cal State LA.

- A full SBS Collaboration meeting was held at JLab on June 4-5. The meeting included reports from all sub-groups on progress and plans. The Collaboration appears to be strong and motivated.
- Project is staffed appropriately for this beginning stage, and includes a Jefferson Lab manager, scientist, and magnet engineer.
- On June 25 Brookhaven informed us that the magnet yoke and plate materials were cleared for shipping. Milestone 1.2-01M has almost been achieved. Delivery is expected before the end of July.

WBS 1.1 Magnet, Power and Construction:

- Continuing yoke modification drawings. (70% completed)
- Continuing detail drawings of new coils. (30% completed)
- Power supply specification completed, in procurement for sole source processing. (75% completed)
- Detail design of field clamps and clamp supports. (20% completed)
- BNL completed survey of yoke and plate materials. Arranging shipment, plan to receive by the end of July.

WBS 1.2 Magnet/Detector Platforms:

- Continuing design details on magnet counter weight support. Some redesign needed because material from BNL is a different size and weight than planned.(65% completed)
- Completed floor plate design, roller brackets and magnet mounting brackets.
- Designing detector supports. (30% completed)

WBS 1.3 Beam Line:

- Layout and design of shielded beam pipe and vacuum snout. (20% completed)

WBS 1 Costs:

- Budget for this WBS for FY13 is \$838K.
- Costed and obligated to date (as of 7/1/2013): \$52,377 (6.25%)

WBS 2: Neutron Form Factor

WBS 2	Neutron Form Factor	WBS 2.01	Milestones
		WBS 2.02	Project oversight
		WBS 2.1	GEMs (UVa)
		WBS 2.2	GEM Electronics (UVa)
		WBS 2.3	Electronics Hut, Lead Shielding, Lead platform, and Detector Frames
		WBS 2.4	Coordinate Detector

WBS 2.01 Milestones:

ID #	Level	Milestone	Scheduled Date	Expected date 6/1/2013	Expected date 7/1/2013	Actual Date
2.1-01M	1	Project start	10/1/2012	10/1/2012	10/1/2012	10/1/2012
2.2-01M	2	UVa receives GEM parts	2/3/2014	2/3/2014	2/3/2014	
2.2-20M	2	UVa receives electronics parts	8/20/2014	8/20/2014	8/20/2014	
2.2-10M	2	UVa GEM modules assembled and tested	10/17/2014	10/17/2014	10/17/2014	
2.2-40M	2	Coordinate Detector Assembled	11/17/2014	11/17/2014	11/17/2014	
2.2-30M	2	UVa front-end electronics assembled and tested	2/2/2015	2/22/2015	2/22/2015	
2.2-40M10	2	WBS 2.3 completed (Electronics Hut Assembled etc.)	10/5/2015	10/5/2015	10/5/2015	
2.1-10M	1	Project completion	1/29/2016	1/29/2016	1/29/2016	

WBS 2.02 Project Oversight:

- SBS weekly meetings, held via tele and video conference were limited in June due to conflicts with the SBS Collaboration meeting on June 4-5, the Hall A Collaboration meeting on June 13-14, and the Program Advisory Committee Meeting on June 17-20. During this Report period, only one meeting was held on June 19th. Participants included Jefferson Lab, University of Virginia, University of Massachusetts, Carnegie-Mellon University, University of Connecticut, and Cal State LA.
- Project is staffed appropriately for this beginning stage, and includes Jefferson Lab (manager, scientist), UVa (two scientists), and Idaho State University (one scientist).

WBS 2.1 GEMs (UVA):

Pre R&D work on the production of GEM modules for WBS 2.1, aimed at starting production work, has continued. A draft R&D report is in hand and is being reviewed. Below is a report on how that pre R&D work is progressing.

With the successful completion and evaluation of GEM chambers in May, UVa has reliably achieved the capability needed to construct GEM chambers for SBS. In June the final prototyped design was completed. The design is based on previous prototype testing, and includes the following improvements:

- Add extra high voltage input leads to the common side of the GEM foils. When connected through the capacitors to ground that common side will serve as a faraday cage for the sensitive strips of the readout.
- Reduce the number of spacers inside the GEM module to minimize the loss of efficiency due to these spacers as reported last month.

WBS 2.2 GEM Electronics (UVa):

As with WBS 2.1, pre R&D continues on the GEM electronics. Below is a report on that work.

UVa is currently waiting for electronics modules from CERN and from Italy; nothing new to report. With the full assembly of both DAQ setups full comparative testing can be done.

WBS 2.3 Electronics Hut, Lead Shielding, Lead platform, and Detector

Frames:

- No activity this period.

WBS 2.4 Coordinate Detector:

- No activity this period.

WBS 2 Costs:

- Budget for this WBS for FY13 is \$81K.
- Costed and obligated to date (as of 7/1/2013): \$21,901 (27.0%)

WBS 3: Proton Form Factor

This Project is not scheduled to start until FY14: October 1, 2013. The WBS structure and milestone table are included below for completeness.

WBS 3	Proton Form Factor	WBS 3.01	Milestones
		WBS 3.02	Project Oversight
		WBS 3.1	Magnet Pole shims and exit field clamp
		WBS 3.2	GEM's (UVa)
		WBS 3.3	GEM electronics (UVa)
		WBS 3.4	Trigger (RU)

WBS 3.01 Milestones:

ID #	Level	Milestone	Scheduled Date	Expected date 5/1/2013	Expected date 6/1/2013	Actual Date
3.1-01M	1	Project start	10/1/2013	10/1/2013	10/1/2013	
3.2-01M	2	UVa receives parts for GEM modules	8/20/2014	8/20/2014	8/20/2014	
3.2-10M	2	UVa begins assembly of electronics	1/5/2015	1/5/2015	1/5/2015	
3.2-50M	2	RU begins trigger design	1/6/2016	1/6/2016	1/6/2016	
3.2-20M	2	UVa electronics assembly and tests completed	7/20/2016	7/20/2016	7/20/2016	
3.2-30M	2	JLab receives pole shims	8/22/2016	8/22/2016	8/22/2016	
3.2-40M	2	JLab receives exit field clamp	8/22/2016	8/22/2016	8/22/2016	
3.2-70M	2	RU completes trigger	12/1/2016	12/1/2016	12/1/2016	
3.2-60M	2	UVa GEM modules assembled (and tested)	2/2/2017	2/2/2017	2/2/2017	
3.1-10M	1	Project completion	7/31/2017	7/31/2017	7/31/2017	