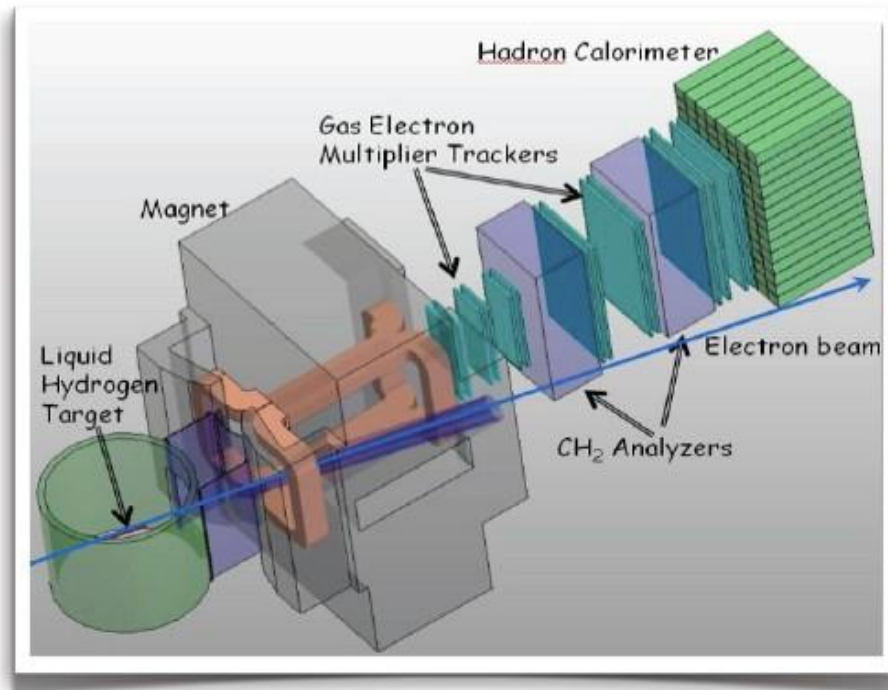


Super-BigBite-Spectrometer (SBS)

Monthly Progress Report

April 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 seventh 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.

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 3/1/2013	Expected Date 4/1/2013	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	4/30/2013	4/30/2013	
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 are being held via tele and video conference almost every Wednesday. During this Report period, meetings were held on Mar 6th, Mar 13th, Mar 20th and Mar 27th. Participants included Jefferson Lab, University of Virginia, St. Mary's University, William and Mary, University of Massachusetts, Carnegie-Mellon University, University of Glasgow, Norfolk State University, Idaho State University, and INFN – Rome.
- Project is staffed appropriately for this beginning stage, and includes a Jefferson Lab manager, scientist, and magnet engineer.

WBS 1.1 Magnet, Power and Construction:

- Completed checking the physical layout for interferences and checked configurations for all experiments. (100% completed)
- Brookhaven National Laboratory, BNL, is finalizing radiation surveys for transport of the magnet yoke material. JLab is submitting the requisition for shipping and rigging of the magnet, and we are still on track to have the magnet delivered by April 30. However, there have been some delays at BNL related to the formal property transfer process, and declaring the magnet as excess property.
- Defined the cutouts/machining needed for the beam line fit through the magnet yoke. Starting yoke modification drawings. (30% completed)
- Continue detail drawings of new coils. (20% completed)
- Draft power supply specification completed. (Final Specification 40% completed)
- Defining field clamps and design of clamp supports. (10% completed)

WBS 1.2 Magnet/Detector Platforms:

- Continuing design work on magnet counter weight support to incorporate movement of support to relocate magnet as needed. Working on design details of rollers, jack mounts, magnet bracket, and floor plates. (60% completed)
- Designing detector supports. (20% 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 4/1/2013): \$30,604 (3.65%)

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 3/1/2013	Expected date 4/1/2013	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 are being held via tele and video conference almost every Wednesday. During this Report period, meetings were held on Mar 6th, Mar 13th, Mar 20th and Mar 27th. Participants included Jefferson Lab, University of Virginia, St. Mary's University, William and Mary, University of Massachusetts, Carnegie-Mellon University, University of Glasgow, Norfolk State University, Idaho State University, and INFN – Rome.
- Thia Keppel, the Hall A Group leader visited UVa on Friday March 29 and in the course of her visit inspected the GEM module manufacturing facilities there.
- 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. Below is a report on how that pre R&D work is progressing.

- In March all GEM foils and frames for the first two 50 cm x 50 cm prototype chambers were tested.
- The CERN GEM group proposed procedure for the pulsed high voltage conditioning of GEM foils was implemented and a report on the established procedure was submitted to SBS management.
- The assembly of the first 50 cm x 50 cm prototype was completed.
 - This chamber is now ready for testing.

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.

- INFN built APV readout hardware was moved from UVa to Jefferson lab, where a UVa graduate student is performing noise studies and, in coordination with a JLab expert, integrating that electronics into CODA DAQ.
- UVa provided input to a new version of the INFN readout system.
 - Orders have been placed for a set of electronics of this new version.
- Some of the components for an additional 10,000 channel SRS (from CERN) readout system arrived at UVa.

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 4/1/2013): \$12,332 (15.2%)

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 3/1/2013	Expected date 4/1/2013	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	