# Report of the Fifth Meeting of the Fermilab Testbeam Committee

November 3, 2017

## 1 Introduction

This is a report of the fifth Fermilab Testbeam Committee meeting held on November 3rd, 2017, at Fermilab. The Fermilab Testbeam Facility (FTBF) is a valuable resource for the HEP community. It provides a US-based facility for developing new detectors, which is used by many in the HEP community, including parties not otherwise heavily represented at FNAL (e.g., ATLAS and PHENIX collaborations.) In FY17 three of the four LHC experiments used the FTBF facilities, and the usage continues to be strong. Overall, the goal of the committee is to give advice to the Fermilab Directorate on how to optimize the impact of the facility and its use. The charge for the meeting is presented in the Appendix.

The overall assessment of the committee is that the FTBF staff is doing a great job with limited resources to provide a key service to the particle physics community. Sixteen experiments were performed this year, which is the same as the number reported in last year's report, showing the enduring need for a facility like this in the United States.

## 2 Summary of the meeting

The agenda of the meeting can be found in Appendix A.

The meeting started with a reading of the charge by Dr. Bhat, followed by a brief emphasis on the most important issue that faces the FTBF at the next year: the discussion of the allocation of the fraction of protons dedicated to the facility.

Several presentations were given by Dr. Rominsky. The first covered the actions undertaken in the last year with respect to the previous recommendations of the committee. We are pleased to see that many of the recommendations from the past have been addressed. The improved ORC process and the new DAQ program that is being supported by the Scientific Computing Division at Fermilab are two major updates that we anticipate will greatly benefit the ease of use of the facility to the users. We are also glad to hear that a new ad has been posted for increasing the staff at the facility, but are disappointed to hear that the previously identified need of six months of person-time were not met in 2017. It is nice to see the creative use of the limited resources by the employ of student researchers to characterize the beam, but that should not distract from the need of additional professional support for FTBF.

The discussion this year about possible changes to the amount of run-time of the facility, following the ending of the SeaQuest experiment, mean that the FTBF must

continue to justify the existence of its program to outside reviewers. We are happy to see that the staff is tracking the number of internal papers, conference proceedings, and published papers.

The facility has undergone some upgrades in the past year. The upgraded computers and facility surely make the test beam better for the users and it sounds like the newly purchased DRS4 boards have already found their use by two of the experiments.

# 3 Recommendations

Below please find a list of recommendations generated by the annual report and the meeting.

We find the plan for the test beam facility in FY2018 convincing and do not recommend any changes to the amount of beam sent to the facility in light of the end of SeaQuest. The fraction of the protons available to the physics program that are diverted to the FTBF is capped at 10% (if the facility were up 100% of the time that beam is available.) Due to the nature of the facility, with experiments being installed and removed regularly, the actual fraction is a lot lower and was 2.68% in FY2017.

- Continue to prepare and plan for a spike in requests at the FTBF during the next long CERN shutdown. The period during 2019/2020 will be crucial for the LHC HL-LHC upgrades, and a time where the CERN facility will be unavailable.
- Develop a clear accounting for the actual fraction of protons that are sent to the facility compared to the total available to the physics program. Ensure that this fraction is used to describe the impact of the FTBF on the physics program (the "proton tax") rather than the maximum 10%.
- Work with ATLAS and CMS to ensure that the requests for beam from those experiments are prioritized by the experiments.
  - Work with the experiments to develop a contingency plan if the amount of beam time is reduced.
- Continue to track the number of papers, conference talk, conference proceedings and internal notes generated based on data taken at the FTBF, to accurately account for the impact of the FTBF.
- Write the standard paragraph to be included in papers and conference proceedings and hand it to the experiments when they arrive on site.
- Track and report in the annual report
  - how much beam you are using,
  - how efficient your experiments are,
  - how many experiments you run in parallel, and
  - what the average setup time for each experiment is.

# 4 Summary

The Fermilab Testbeam Committee thanks the staff for putting together the annual report and the useful presentation, and commends them to continue to operate the FTBF successfully in light of tight budget and manpower constraints. Much progress has been made since the last meeting towards getting understanding of the facility and working towards its future. The test beam continues to be an important resource for HEP, and will be increasingly so during the lead-in to the LHC upgrades, when the CERN facility is shut down. Much credit must be given to Dr. Rominsky and her team for running the test beam.

We look forward to our next meeting.

# A Agenda of the meeting

The agenda can be seen at this URL:

`https://indico.fnal.gov/event/15546/`,

and is copied below for the record.

| Time | Length | Title | Speaker |
|---|---|---|---|
| 10:00 AM | 15m | Executive Session | |
| 10:15 AM | 15m | Progress on recommendations | M. Rominsky |
| 10:30 AM | 10m | Discussion | All |
| 10:40 AM | 20m | Annual FTBF Report for FY17 | M. Rominsky |
| 11:00 AM | 15m | FY18 Plans and Beam Requests | M. Rominsky |
| 11:15 AM | 10m | Discussion | All |
| 11:25 AM | 15m | Break | |
| 11:40 AM | 50m | Community input and discussion | |
| : | 10m | ATLAS test beams | Jessica Metcalfe |
| : | 10m | CMS test beams | Lorenzo Uplegger |
| : | 10m | No$\nu$a test beams | Alexandre Pereira Sousa |
| 12:30 PM | 60m | Executive Session | |
| 1:30 PM | 30m | Closeout | |

# B Committee Membership

- Carsten Hast, SLAC
- Ron Lipton, FNAL
- Jen Raaf, FNAL
- Mayly Sanchez, Iowa State
- Guy Savard, ANL
- Mandy Rominsky, FNAL (*ex-officio*)
- Henric Wilkens, CERN
- Peter Wittich, Cornell (chair)

Additionally, the meeting was attended by the following Fermilab employees.

- JJ Schmidt
- Pushpa Bhat
- Stephen Geer

This was a phone meeting; most of the committee attended remotely.

## C Charge for the meeting

The test beam facilities at Fermilab are a valuable resource for the HEP community. The committee is asked to give advice to the Fermilab Directorate on the operation and development of the Fermilab Test Beam Facility (FTBF), and on any programmatic choices needed to optimize its use and scientific impact. In particular, at the present meeting the committee is asked to comment on:

1. The community usage and the scientific impact of the FY17 FTBF program, as documented in the annual FTBF report.

2. Progress made by the test beam operations team and the Lab in following-up on the committee's recommendations from the previous meeting held in October 2016.

3. The plan for the FY18 FTBF program, facilities and resources, particularly the beam time request by FTBF team, as presented at this meeting.

The Directorate will welcome any other comments from the committee about utilization of the facility, the need for programmatic choices, and the need for facility enhancements.

The committee is asked to deliver a short written report to the Office of Program Planning by November 13, 2017.