

October 16, 2006

Physics Advisory Committee
October 19-21, 2006

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Introduction

At this meeting, we ask you to consider two proposals, MIPP and COUPP, one extension request, MiniBooNE, and to review a Stage-I-approved experiment, Drell-Yan/E-906. Two of these items, MIPP and E-906, relate to operation of the SY120 program in the Meson Laboratory; and COUPP is a continuation of a detector development effort toward dark matter physics sensitivity. In addition, we will review highlights of the ongoing physics program, including one component which relates to future running in the Meson Laboratory, ILC detector R&D. The main focus of your deliberations should be on the physics priorities of these efforts. We would like to have your written recommendations on these efforts.

You will also hear progress reports on the Laboratory's collider and neutrino experiments. We would like to have your written comments on the state of these physics programs.

P-960 (Rajendran Raja) "Main Injector Particle Production (MIPP)"

MIPP completed its data acquisition at the end of February this year. They collected a fraction of the data that they had anticipated, although the beam delivery was not the issue. An updated collaboration is proposing to upgrade the detector and data acquisition system for improved capability. This would allow them to increase the data for the physics originally proposed. They are also identifying additional physics, which the new capability would allow. There is some increased emphasis on the synergy between this work and mainstream components of the Laboratory program, both neutrino physics and ILC physics.

Please comment on the physics goals of the proposal, the appropriateness of the proposed upgrades, and the physics priority which should be given to this effort if approved.

E-906 (Paul Reimer/Don Geesaman) "Drell-Yan"

E-906 was approved in November of 2001, when we expected the run of E-906 to piggy-back on an approved CKM experiment. The possible DOE-NP funding of the detector has been delayed until now, and we no longer plan on operation for the CKM experiment. The proponents of E-906 have adjusted their plans in the face of these developments, and still retain the original physics goals of the experiment. The experiment would be done in a different beamline than originally planned, with higher beam intensities, and a longer running period.

Please comment on the physics reach of the experiment as reconfigured, on continuing interest in the physics measurements, and on the physics priority which should be given to this effort if we should proceed.

E-944 (Steve Brice/Richard Van de Water) "MiniBooNE Extension"

E-944 was approved to run in the period FY2006 with an expectation that the beam delivered would be in the range $1-2 \times 10^{20}$ protons-on-target (POT). The experiment hoped to reach the top

end of the range, near 2×10^{20} POT. Having used some running for systematic studies associated with the primary oscillation measurement, they have accumulated over half of this amount at this point running anti-neutrinos, and request additional running time to reach their original POT goal. If extended for further running, MiniBooNE would share the beam with SciBooNE, and would coordinate neutrino and anti-neutrino data-taking times through Program Planning.

Please comment on the impact of the additional data on the physics reach of the experiment, the appropriateness of the requested extension, and the physics priority which should be given to this effort if the extension is granted.

P-961 (Juan Collar) "Chicagoland Observatory for Underground Particle Physics (COUPP)"

A proposal (P-961) has been received to extend the R&D efforts of T-945 on a continuously sensitive bubble chamber detector to the level where it could provide useful physics reach for dark matter in some models.

Please comment on the appropriateness of the requested support, and the physics priority which should be given to this effort.

Collider Physics

You will hear brief status reports on the accelerator operations for Run II at the Tevatron and on the associated experimental program, as well as the status of CMS and preparations for the first data from the LHC.

Please comment on the status and continuing prospects for Run II at the Tevatron and for CMS at the LHC, focused on Fermilab's role rather than either the progress of global CMS or that of US CMS.

Neutrinos

You will hear about the status of both the neutrino running of MiniBooNE (E-898) and of MINOS (E-975). MiniBooNE continued running in neutrino mode until January of this year, and received 7×10^{20} protons on target. The NuMI/MINOS beamline and experiment are now in the first phase of operations, with over 10^{20} protons on target, and have shown their first neutrino-oscillation result. You will also hear an update of the plans for increasing the proton intensity. Please comment on the status and continuing prospects for both these experiments.

ILC Detector and Physics at Fermilab

You will also hear about the status and plans for the Laboratory's growing efforts on ILC detector and physics R&D.

Please comment on the status, appropriateness, and continuing prospects of these efforts.