

August 28, 2002

Prof. Kirk McDonald
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Dear Kirk:

This letter comes to respond to your Proposal, P965, "Proposal to Measure the Efficiency of Electron Charge Sign Determination up to 10 GeV in a Magnetized Liquid Argon Detector (μ LANNDD)" and to thank you for your oral presentation of the proposal to the PAC at their August 26-27, 2002 Meeting at BNL. The PAC members examined the proposal, listened to the oral presentation and discussed the proposal with Laboratory management. After serious discussion among the members, including Laboratory management, the PAC provided me with the following written advice:

"AGS P965 requests one week of beam time in the A3 beam line to study the properties of liquid argon time projection chambers to verify that such a detector can be operated with the electric field perpendicular to the magnetic field and to characterize the determination of the sign of electrons or positrons in electromagnetic shower events for tracks with momentum from 1-10 GeV. Liquid argon time projection chambers offer many attractive features for large-scale detectors of neutrino interactions. The ICARUS collaboration has made significant strides in developing this technology in systems without magnetic fields. However, for certain applications in neutrino oscillation studies (i.e., muon decay beams), it is necessary to determine the sign of the charged lepton in the detector following a neutrino interaction. While this is expected to be straightforward for muon tracks, the situation is more difficult in the complicated topology of an electromagnetic shower of an electron event. This measurement would provide the first large scale test of such a TPC in a magnetic field, and confirm that the position resolution can be maintained with an electric field perpendicular to the magnetic field.

The PAC would like to reconsider this proposal after seeing detailed simulations of the expected realistic performance of this TPC for electron shower events. A successful proposal would also need to demonstrate how the proposed experiment is integrated into the world-wide effort to explore this technology."

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I am accepting this recommendation and therefore postpone a decision on approval of P965, without prejudice, until your collaboration has complied with the requested simulation work called for by the PAC. In this context, I also take note of your comment during the oral presentation that such a simulation will likely require several person-months to accomplish. Given that the experimental apparatus and test are expected to cost of order \$1M, it seemed appropriate and prudent to first carry out a simulation effort before committing to an investment in the physical apparatus and beam test. The results of the simulation work could be submitted either within a revised proposal or as an addendum to the original proposal.

Let me also comment on the final sentence in the PAC recommendation. As I understood it, the PAC asks that the proposed physical test should be placed in the worldwide context of R&D work being performed on liquid argon time projection chambers and demonstrate that the work will be complementary to other activities in this area of instrumentation development. This, again, is a reasonable requirement given the substantial cost of the proposed work in P965.

I am available to discuss this outcome and decision if you feel it would be useful.

Best regards,

Thomas B.W. Kirk
Associate Laboratory Director
High Energy and Nuclear Physics

Cc: PAC Members

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