

To: Tomasz Matulewicz, Peter Seyboth, and Marek Gazdzicki

Dear NA61 Collaboration Board,

This is a letter of intent from the Neutrino Team at Los Alamos National Laboratory to join the NA61/SHINE collaboration for the purposes of making measurements of hadron production for the Fermilab neutrino program.

Person joining NA61: Geoffrey Mills, Neutrino Team Leader, 20% effort on NA61

Experience and Interests

Geoffrey Mills has been a staff scientist since 1990, and leader of the LANL neutrino team (now 10 members) since 2006, at Los Alamos National Laboratory. He received his Ph.D. from the California Institute of Technology in 1985, after studying the decays of the τ lepton and the mass of the τ neutrino. He then did his post-doctoral research at CERN on the LEP storage ring, and measured the width of the Z^0 resonance and the number of active neutrinos. He then proposed and designed a silicon vertex detector, which was used to search for the Higgs boson at LEP. After developing silicon tracker designs for the proposed Superconducting Super Collider detectors, he began researching neutrino oscillation phenomena at Los Alamos National Laboratory with the LSND experiment, where he designed powerful, Likelihood-based reconstruction algorithms and event selection criteria. Based on his experience on LSND he proposed, and worked to develop, the follow-on MiniBooNE experiment. He led the effort to measure hadron production for the MiniBooNE neutrino beam, by organizing a US contingent that participated in the HARP (PS-214) experiment, and by making measurements crucial for the MiniBooNE flux predictions. He has since worked on the planning and proposal for the next generation of neutrino experiments, the Long Baseline Neutrino Experiment (LBNE), and the Fermilab Short Baseline Neutrino (SBN) program, and is now leading the US-NA61 proposal effort, which is funded through a DOE grant to Los Alamos National Laboratory.

Proposed Contributions to NA61/SHINE

The Los Alamos team is interested in making hadron production measurements that will benefit the upcoming LBNE experiment. This includes taking data for hadron production from both protons and pions on suitable targets (such as canon, steel, and aluminum), at higher indecent beam energies of 60-120 GeV. Over the next two years, the team expects to oversee the hardware upgrades and the run plan execution for the Fermilab hadron production measurements. As members of the NA61/SHINE collaboration, we expect to contribute yearly to the common fund and to participate in data-taking shifts. We plan to attend the collaboration meetings in-person (or by video when it is not possible to travel).

We look forward to working with the NA61/SHINE collaboration and appreciate your consideration of this letter.

Dr. Geoffrey Mills, Neutrino Team Leader
Subatomic Physics Group
Los Alamos National Laboratory
email: mills@lanl.gov
cell:+1(505)690-2506
tel:+1(505)667-7330
fax:+1(505)665-7920

