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Accelerator Division/Accelerator Physics Department

To: Prof. David Rubin, Chair of the 2005 APS Outstanding Doctoral Thesis Research in Beam Physics Award Selection Committee

From: Dr. V. Shiltsev, Accelerator Physics Department Head, FNAL

27 October 2005

Dear Prof. Rubin,

This letter is to nominate Dr. Kip Bishofberger of LANL for the APS Outstanding Doctoral Thesis Research in Beam Physics Award. He received his PhD from UCLA in June 2005 with thesis topic "Successful Beam-Beam Tuneshift Compensation". The results presented in his thesis are novel and open road for tuneshift compensation in the LHC and other proton machines.

I have known Kip Bishofberger since 2000, and I have seen him grow as a student into a physicist over that time. I was his mentor at Fermilab (his PhD thesis advisor was Prof. James Rosenzweig of UCLA). When he first started working with the Tevatron Electron Lens (TEL) group, we had begun testing the first electron gun on our test setup. Kip quickly learned about the experiment, the Tevatron, and advanced beam physics of circular accelerators and space charge dominated electron beams. He has been a leader in doing experiments and interpreting results. He has made significant contribution to the TEL magnetic measurements (magnetic arrow measurements were done by him alone), TEL control and safety system, beam profile measurements in the Linac Lab test facility (with pin-hole collector) and in the TEL-1 (with wires), anode voltage monitor. He fully designed and built the HV distribution box. Kip was never afraid "to make hands dirty" – e.g., he did vacuum assembly work together with me and techs, he was responsible for the TEL-1 cable pulls (some 50k\$ project) and had done it successfully. He, XL Zhang, Gennady Kuznetsov and myself shared the efforts to carry out tune-shift compensation studies, resulted in demonstration of a tuneshift of 0.01 for 980 GeV protons, and, later, in the first evidence of successful beam-beam compensation. Kip was very much involved in doing studies before and after the TEL was installed in the Tevatron, and provided many creative and insightful observations during these studies. On his own, he did collect data, pre-processed them (most often – in Origin, which is default package for the BBC group), did analysis and reported results. Kip was particularly good in the data collection and setting up an experiment before taking data in a way to get the best data quality he can.

Kip was the key to make the project a success: besides demonstration of the tuneshift 980 GeV (anti)protons of about 0.01 and acceptable lifetime, the first electron lens was proven to be an effective remover of the unwanted DC beam in the abort gap (particles leaking from main buckets). Since 2002, TEL is in 24/7 operation for the Tevatron Run II.

Kip communicated very well with physicists, engineers and technicians. He often directed or worked with engineers or technicians during installations, repairs, or upgrades. That was very important and fruitful during the TEL design, fabrication and test era. As part of TEL team he has published many papers (actually, quite impressive list for a PhD student!). His Ph.D. thesis is quite well-written.

After finishing his PhD in June 2005, he accepted an offer from LANL and joined Bruce Carsten group.

Once again, I recommend Dr. Kip Bishofberger for the APS Outstanding Doctoral Thesis Research in Beam Physics.

Sincerely,

A handwritten signature in black ink, appearing to read "V. Shiltsev (V.S.)". The signature is fluid and cursive, with the initials "V.S." clearly visible at the end.

Vladimir Shiltsev