

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

October 31, 2005

Dear Prof. Rubin,

This letter is in support of Dr. Kip A. Bishofberger's nomination for the APS Outstanding Doctoral Thesis Research in Beam Physics Award. Dr. Bishofberger defended his thesis "Successful Beam-Beam Tuneshift Compensation" and received the PhD degree from UCLA in June 2005.

Proposed by D. Finley and V. Shiltsev idea to compensate beam-beam effect in the Tevatron with the help of electron lenses was initially met with skepticism in the accelerator physics community. Such a device, would it work at all, could produce more damage to the beam than cure. It required a certain courage from a beginning scientist to join a project with slim chances for success.

Another difficulty which Kip had to overcome was lack of experience in advanced accelerator theory. Working on the project he not only quickly picked up the required knowledge, but became the driving force in performing and interpreting experiments with the first TEL (Tevatron Electron Lens). Besides experimental studies and theoretical analysis Kip was doing whatever was necessary for the progress of the project, not shunning most unenviable work like pulling cables, hunting vacuum leaks and bad connectors.

The perseverance and dedication of the team which Kip was an essential member of paid off first with successful demonstration of the TEL ability to produce significant tuneshift without deteriorating lifetime of a single bunch (proton for the sake of availability) and then with experimental proof of possibility to diminish the beam-beam induced emittance blow-up in colliding antiproton bunches.

These groundbreaking achievements open the prospect of using electron lenses for the space-charge compensation in high-current proton accelerators and, of course, beam-beam compensation in future hadron colliders. So the subject and results of Dr. Bishofberger's PhD thesis have scientific importance surpassing the initial goal of coping with beam-beam effect in Tevatron.

The thesis itself is very neatly organized and clearly written (a few misprints not be taken into account) showing Dr. Bishofberger's good understanding of the underlying physics.

Summing up, I am sure that Dr. Kip A. Bishofberger deserves the APS award for his doctoral thesis research in beam physics.

Sincerely

Yuri I. Alexahin
Leader of Run II Physics Group of the
Fermilab Accelerator Physics Department