



THE COCKCROFT INSTITUTE of
ACCELERATOR SCIENCE AND TECHNOLOGY

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December 12, 2006

Prof. Maury Tigner,
Director,
Laboratory of Elementary Particle Physics,
Newman Laboratory,
Cornell University,
Ithaca, NY 14853-5001
USA

Dear Prof. Tigner,

Conversion and operation of CESR as an ILC damping ring test accelerator

Thank you for the information that you provided for me on the proposal to develop CESR as a test accelerator (CesrTA) for the International Linear Collider (ILC). I am impressed by the capabilities that CesrTA would provide for studies of a range of critical issues for the ILC damping rings, particularly regarding the beam quality and stability that the damping rings will have to achieve.

As you know, I have been a member of the Global Design Effort for the ILC since its inception in 2005, with joint leadership responsibility for research and development for the damping rings. The significant technical challenges facing the damping rings have attracted considerable attention from the community, and a recent evaluation of priorities by the GDE's Global R&D Board has highlighted the need for beam tests of systems relating to a number of the key issues. These issues include the electron cloud effect that threatens to limit beam quality in the positron damping ring, and could be particularly difficult to control in wiggler-dominated storage rings, such as the damping rings. CesrTA would provide a unique facility for studies of electron cloud effects under conditions directly relevant to those in the ILC damping rings.

Other critical issues facing the ILC damping rings include ion effects in the electron damping ring, alignment and tuning for ultra-low emittance beams, and development of instrumentation and diagnostics for control and measurement of such beams. In all these areas, CesrTA would provide a unique or world leading facility, with the capability of making essential contributions to the damping rings research and development program.

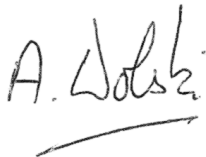
It seems clear from the studies already made, that the modifications required to convert Cesr-c into CesrTA are on a scale consistent with the commissioning and operation of CesrTA over a period well matched to the research and development program for the ILC over the next few years. An essential aspect of the timeliness of the proposed project is the fact that CesrTA would be developed from a machine that is well understood from many years of operation, with an experienced and highly skilled team of scientists and engineers.

I would also like to remark that it is very encouraging to see a strong element of international collaboration within the research program proposed for CesrTA. The ILC will be an enormously challenging undertaking, with the damping rings presenting as many difficult accelerator physics issues as any other part of the machine. A successful outcome for the research and development program, no less than for the construction and operation of the ILC itself, will depend on full involvement of many institutions around the world, combining skills and resources in a well planned and coordinated manner.

One area of particular interest for us at the Cockcroft Institute is that of tuning and coupling correction for achieving ultra-low vertical emittance. I have been involved over the past few years in such studies at the KEK-ATF, and appreciate the challenge that the ILC damping rings specifications present in this respect. We are planning some theoretical and simulation studies on this topic here at the Cockcroft Institute, and, with the focus of the ATF moving away from damping rings towards final focus issues in future, would greatly value the opportunity for experimental studies at CesrTA. This would fit extremely well with the interest of some of our UK colleagues in the survey and alignment systems, and in the low-emittance beam diagnostics.

I am pleased to offer my support for the proposed development of CesrTA, and hope to be able to participate in the research program at this facility. I believe that CesrTA would provide a unique facility for addressing some of the most challenging issues facing the damping rings, including electron cloud, ion effects, and alignment and tuning for achieving ultra-low beam emittance. Successfully addressing these issues will be essential for the design optimization, commissioning and successful operation of the ILC damping rings.

Yours sincerely,

A handwritten signature in black ink that reads "A. Wolski". The signature is written in a cursive style with a horizontal line underneath the name.

Dr Andrzej Wolski
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University of Liverpool and the Cockcroft Institute.*

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