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December 18, 2006

To: Maury Tigner

From: Marc Ross

Subject: Bob Meller

Dear Maury,

The Accelerator Test Facility at KEK is intended for the development of ILC damping ring design, development of precision beam instrumentation and training of accelerator scientists and engineers. Together with Professor Junji Urakawa and the KEK ATF group, a team from the SLAC ILC Division has made great progress toward these goals through a strong international effort over the past 8 years. Our principle achievements, published in PRL, NIM and PR-STAB include the generation of ultra-low emittance beam, demonstration of required emittance damping, perfection of a high resolution, precision laser-based beam profile monitor, demonstration of high resolution, nanometer-scale beam position monitors, demonstration of fast rise time stripline kickers and Masters/PhD degree training of more than 20 graduate students from Asia, Europe and US.

During the last 3 years, since the decision to select superconducting RF technology for the ILC, the number of projects underway at ATF has increased substantially. During a typical operational cycle, 15 or more students and a similar number of accelerator scientists are present.

In 2004 we asked Bob Meller from Cornell to join the group, at that time focused on the development of RF cavity beam position monitor system design, fast rise time kicker pulsers and RF stabilization. His help in each of these, and in working with the students at the facility, has been very important.

In the next two years, the ATF complex will be extended to provide a test facility for ILC final focus. We expect the new facility, called 'ATF2', to be ready for commissioning in late 2008. A primary goal is the generation and stabilization of electron beams with vertical size of roughly 35 nm. The US contribution to the project consists of kicker pulsers, cavity beam position monitor electronics and supporting systems. We feel, based on the last 3 years experience that Bob Meller will be able to contribute to our work in each of these areas in particular, and in the achievement of the ATF2 goals in general. We expect ATF and ATF2 to provide useful information for ILC design

development through the design and construction phase of the ILC project, beyond 2012.

Specifically, Bob will help us with:

- 1) Assembling and testing fast kicker pulsers based on innovative semi-conductor technology.
- 2) Diagnosing and correcting problems with ATF ring low level RF precision phase control circuitry.
- 3) Implementation of precision phase-locked RF calibration and receiver signals for the new ATF2 cavity BPM system
- 4) Development of receiver circuit in-situ calibration and test for ATF ring BPM system upgrades.
- 5) Development and testing, including beam testing, of special ATF2 cavity BPMs. ATF2 has 4 different cavity BPM systems.
- 6) Coupled – bunch digital feedback control (to be implemented in 2 years).