

SLAC/LLNL R&D Program ILC High Availability DR Kicker

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SLAC/LLNL High Availability (HA) Damping Ring Kicker System Development Program

- HA architecture requirements:
 - Redundant cells per pulser unit (stack)
 - Redundant pulser units per kicker system
 - Diagnostics controls to manage failures of switches, cells or units with zero or minimum machine interruption
- Goals:
 - FY07: Modulator prototype development
 - FY08: Modulator prototype testing and HA element design
 - FY09: HA testing

Work Packages FY07-09

- Goal: Demonstrate *Full System Architecture* for DR Kicker System
- FY07
 - Design prototype cell (~0.6-1 kV per cell)
 - Build and test single cell with fastest available devices
 - Begin design timing system
 - Begin design calibration system
- FY08
 - Down-select switch technology
 - Build and test complete full power N-cell, $\pm 10\text{kV}$, 3 MHz prototype
 - Complete design timing system for prototype stack
 - Implement, test timing on prototype unit
 - Test at KEK ATF
 - Complete design calibration system
- FY09
 - Build, test calibration system prototype cell(s)
 - Construct 2 each new Unit #2 with design improvements
 - Evaluate system performance including timing, calibration, full power tests
 - Test 2-unit system operation at KEK ATF

Proposed Level of Effort

	FTE SLAC	FTE LLNL (\$K)	M&S \$K	Total M&S \$K
FY07	0.3	200	25	225
FY08	1.0	200	50	250
FY09	0.6	200	90	290

Final Comments

- The present technical plan shows promise as long as the desired switch performance can be achieved.
- The main pulser work will continue at LLNL with assistance on controls, timing, diagnostics and testing from SLAC, and field testing at KEK.
- Any switch technology chosen has to be adapted into an HA architecture which requires addressing the packaging, timing, calibration and diagnostic controls features proposed here.
- The ATF collaboration is essential to the testing of kicker performance in a realistic setting.