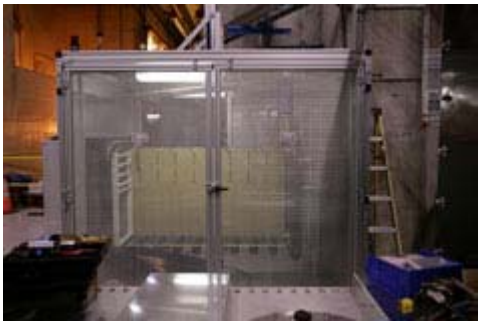
SLAC today

Marx Modulator Begins Testing in End Station B

This week SLAC National Accelerator Laboratory moves one step closer to producing an innovative new piece of the International Linear Collider. The first-generation model of a new design for equipment that helps power the accelerator is moving from the SLAC Power Conversion Department to End Station B, where it will undergo long-term testing.

One of the Marx modulator cells, awaiting installation. (Photo by Calla Cofield. Click for larger image.)



The modulator enclosure in End Station B. (Photo by Calla Cofield. Click for larger image.)

The new Marx modulator will provide long pulses of power to klystrons, which in turn generate microwaves that move an electron beam down the accelerator. The ILC will require hundreds of these powerful klystrons, so the modulator cost and size must be kept to a minimum. The current ILC baseline modulators take up more than 22 feet of tunnel length each, while the Marx modulators take up less than 10 feet. Project leader Craig Burkhart says the new modulators will cost less to build and will be 1/3 more energy efficient than the current ILC baseline.

"We've demonstrated that the voltage and pulse length [of the modulator] meet ILC requirements," says Burkhart. "The next step is to test the reliability, so we're going to run it for extended periods." Another group, led by Chris Adolphsen, will perform the testing. The 120,000 volt modulator will power a test klystron in End Station B for an estimated six to nine months to reveal its long-term performance.

The Power Conversion Department began brainstorming ways to make modulators for a longer, stronger linear collider five years ago. Now that the first-generation Marx modulator is entering extended testing, the group is working on a second-generation design. "We can clearly see areas where this model can be improved," Burkhart says. "This testing may reveal other aspects of the design we can enhance as well."

—Calla Cofield

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