

## Jefferson Lab Weekly Briefs

August 8, 2007

### 12 GeV Upgrade

The 12 GeV Upgrade Accelerator R&D task known as the integrated “Vertical Slice Test” has been completed. The purpose of the test was to demonstrate successful field control of an SRF cavity operating at  $>17.5$  MV/m using the JLab-developed digital low-level RF (LLRF) controls. Tests were run at 20 MV/m using one of the cavities in the Renaissance cryomodule. The system met the 12 GeV Upgrade phase and amplitude specifications using the generator-driven-resonator algorithm. Additional tests of the self-excited-loop algorithm demonstrated its capability to ramp a cavity from 0 MV/m to 20 MV/m in  $\sim 7$  milliseconds.

### Physics

Since the successful completion of E04-018, Hall A has been in restricted access. The main goals for the summer down are preventive maintenance of the power supplies and High Resolution Spectrometer cryogenic systems and the installation of the NaI (sodium iodide) calorimeter for the Coulomb Sum Rule experiment. So far, activities are progressing on schedule.

In Hall B, one of the large drift chambers has been repaired, and another is being prepped for repair. An upgrade of part of the CLAS Time-of-flight system is in preparation. A magnetic field test is planned for a detector needed for the 12 GeV program in Hall D. Further tests of the Frozen Spin Target (FROST) are underway by the Target Group in EEL. The refrigerator is working well, and temperatures of 35 milliKelvin have been achieved. The current focus is on getting the butanol target sample polarized and operational in the “frozen spin” mode.

Hall C is hosting its annual [Summer Workshop](#) this Thursday and Friday, starting at 12:50 on Thursday in F113. The topics for this workshop will be Hadron Structure, Physics of Hadrons in Nuclei, Fundamental Symmetry Tests, Hypernuclei and the 12 GeV Upgrade.

### Environment, Safety, Health & Quality

With the summer Scheduled Accelerator Down in full swing, it’s a good time to discuss simple hand tool use, especially hammers. The use of hammers might seem elementary to many at JLab. But hammers and other striking tools are often misused, and these misuses can cause serious injury. Hammers are made in various sizes and types for specific purposes and for striking surfaces of varying hardness. It is important to select a hammer that is comfortable for you and is the proper type, size and weight for the job. The National Safety Council suggests these steps for using a hammer safely:

- Choose a hammer with a striking face diameter approximately one half-inch larger than the face of the tool being struck;
  - Make sure the head of the hammer is securely attached to the handle;
  - Discard any hammer with a mushroomed or chipped face or with cracks in the claw or eye sections;
  - Always wear safety glasses or a face shield;
  - Strike a hammer blow squarely, with the striking face parallel to the surface being struck;
  - Watch the object you are hitting;
  - Hold the hammer with your wrist straight and your hand firmly wrapped around the handle.
- For more information on hammer and other hand tool use, consult the JLab ES&H Manual [Chapter 6120, Hand and Power Tools](#).

• **Mattress Alert** - The Consumer Product Safety Commission recently published a free publication on the new federal fire-resistant mattress standard. The publication ([CPSC-560](#)), “Sleep Safer: A Fire Resistant Mattress Can Save Your Life,” offers consumers potential lifesaving information on fire resistant mattress selection and other fire safety tips.

### Accelerator

The swapping of Cryomodules continued, with NL11 being disconnected and removed from the tunnel for overhauling. The newly rebuilt

cryomodule called Renaissance was installed in the north linac. First beam out of the new injector load lock gun was accomplished. The Quantum Efficiency of the new bulk wafer was tested and is very high. This is great news! Beam was threaded to the 500 KeV dump, a good start at re-establishing beam in the injector. Rolling power outages have begun; these will allow planned maintenance on the various power stations and equipment distributed throughout the accelerator. The south access building, part of the south linac and the southeast corner of the east arc were the first areas to be brought down for this work.

### **Free-Electron Laser (FEL)**

Strong progress was made on the shutdown tasks, closely mapping onto the established schedule. The Laser Personnel Safety System for three user labs is operating in local laser mode for important preparatory experiments. Lab 1 has the Verdi V10 running for the Light Pseudoscalar Particle Search (LIPPS) experiment; Lab 2 has the Nd:YAG laser running for mirror tests; and Lab 6 has the advanced drive laser undergoing its final acceptance tests. Tests of the sextupoles began last week; it was found that the field is independent of the ramp-rate to better than 10 parts per million. Work preparing the FEL gun for reassembly was completed, which involved the cathode, anode and several mechanical improvements to the moving parts.

### **Theory Center**

The JLab lattice QCD group has just completed a study, arXiv:0707.4162v1 [hep-lat], of the feasibility of reliably extracting multiple excited states using quenched anisotropic lattices with quarks at the charm mass, with a large basis of covariant derivative-based meson interpolating fields. Knowledge of the continuum limit of a lattice interpolating field is shown to give additional spin-assignment information, even at a single lattice spacing, via the overlap factors of interpolating field and state. Excited state masses are found to be systematically high with respect to quark potential model predictions and, where they exist, experimental states,

which is most likely a result of the quenched approximation.

### **Announcements**

#### **• Tee up for the JLab 2007 Fall Golf**

**Tournament!** The tournament will be held Sept. 27 at the Williamsburg Country Club. The four-person teams will be handicapped and must include at least two JLab employees. Cost is \$45 for JLab and \$60 for non-employees. Sign up by Sept. 21 with Mike Zarecky (x7609). Visit [Insight](#) for more information.

**• Walking path closed.** The walking path from the intersection of Canon Blvd. and CEBAF Blvd. to the Residence Facility is closed for the construction of a storm water retention pond.

**• Vendor to operate Stockroom.** In the past, the Lab has operated an in-house stockroom, which maintained an inventory of DOE-funded parts and supplies that was available to both employees and users. During the next fiscal year, the technical stockroom will be phased out and replaced by an onsite vendor store. [Click here](#) for more information about how the stockroom is changing.

#### **JLab's Safety Numbers (August 8, 2007)**

277 Days since Last Recordable Accident (new JLab Record: 277) Congratulations, everyone!  
277 Days since Last Lost Workday Accident (JLab record: 455)

### **JLab Calendar of Events**

Sept. 3: Labor Day holiday

Sept. 7: United Way Day of Caring

Sept. 13: JSA's Electronic Commerce Small Business Vendor Show