***Spherical Crystal-Imager Diagnostic:*** Narrowband imaging of the high-energy photons emitted from targets irradiated with ultrahigh-intensity short-pulse lasers provides crucial information on the time-integrated, energy deposition of the energetic [several million electron volts (MeV)] electrons generated in high-intensity laser–plasma interactions. Spherically bent quartz crystals are used in these experiments to image the $K_\alpha$ emission from copper (Cu) targets. In small-scale laser installations, these spherical crystal-imaging systems are straightforward to align, because an operator can reach into the target chamber and perform the required alignment steps. In large laser installations such as OMEGA EP, the alignment is more challenging since the target chamber is under vacuum at all times and every alignment step must be remotely controlled. A crystal-imaging system, which can be fully remotely aligned, has been qualified for use on OMEGA EP. Figure 1 is a schematic of the crystal imager set up in its alignment configuration. Figure 2 shows an image of the Cu $K_\alpha$ emission from a copper cone irradiated with a 1-kJ, 10-ps pulse from OMEGA EP, one of the first images taken with this system. The cone is 1 mm long and has an opening angle of ~34°. The laser enters the cone from the top and is aligned to hit the inside of the cone tip. The image shows that the laser deposits most of its energy at the tip of the cone, producing a large number of energetic electrons. In addition to the strong emission at the cone tip, $K_\alpha$ emission is observed throughout the cone all the way up to the cone opening. This observation is consistent with the results of previous experiments, which have shown that the energetic electrons are confined to the target by large electric sheath fields at the target boundary. The energetic electrons fill the target like a gas, since the energetic electrons have a range of the order of the cone size.

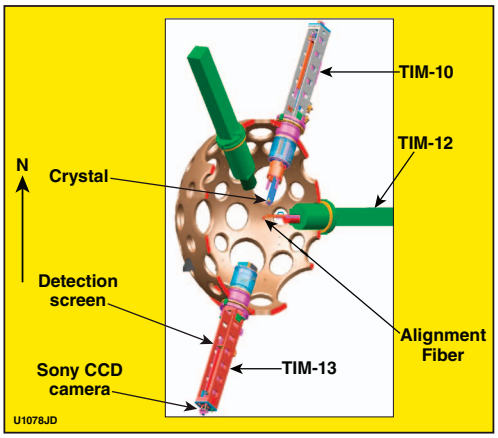

Figure 1. Overview schematic of spherical crystal imager in its alignment configuration.

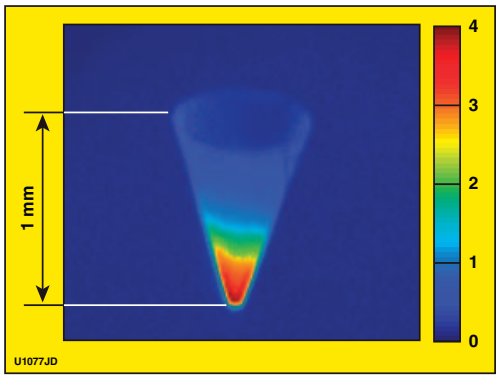

Figure 2. Narrowband image of the $K_\alpha$ emission of a 1-mm-long Cu cone with an opening angle of 34°, irradiated by a 10-ps, 1-kJ OMEGA EP laser pulse.

***NLUF Proposals Approved for FY11 and FY12:*** Based on the recommendations of the technical evaluation panel convened to review proposals submitted to the FY11–FY12 National Laser Users' Facility (NLUF) call for proposals, the Department of Energy (DOE) National Nuclear Security Administration (NNSA) approved 11 of the proposals for funding and shot allocation at the Omega Laser Facility. The 11 projects were allocated a total of 30 shot days each year at the facility. This is the largest annual shot allocation for NLUF projects since the inception of the program at LLE in 1979. The successful NLUF principal investigators for FY11–FY12 are F. Beg (U. California–San Diego), R. P. Drake (U. Michigan), T. Duffy (Princeton), R. Falcone (U. California–Berkeley), P. Hartigan (Rice), R. Jeanloz (U. California–Berkeley), K. Krushelnick (U. Michigan), R. Mancini (U. Nevada–Reno), R. Petrasso (MIT-PSFC), A. Spitkovsky (Princeton), and R. Stephens (General Atomics).

***Omega Operations Summary:*** During August, the Omega Laser Facility conducted 198 target shots: 134 target shots on OMEGA with an experimental effectiveness of 88.4% and 64 target shots on OMEGA EP with an experimental effectiveness of 85.2%. Sixty of these target shots were carried out by LLE-led teams in support of the NIC project. HED programs accounted for 46 target shots carried out by teams led by LLNL and LANL. Forty-four target shots were conducted for the NLUF program by teams led by the University of Michigan, MIT-PSFC, and the University of California at San Diego. The LBS program accounted for 42 target shots taken by teams led by LLE and LLNL and the University of Michigan CRASH Center carried out 6 target shots.

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