

LCLS-II Science Opportunities and Prospects for Multicolor X-ray Science at a High Repetition Rate X-ray Laser

Robert Schoenlein

The Linac Coherent Light Source (LCLS) began operation in 2009 and has already had a significant impact on many areas of science ranging from: structural biology, to chemistry and catalysis, to quantum materials, to matter in extreme environments. LCLS-II represents another major advance in X-ray laser technology, based on continuous superconducting RF technology and tunable undulators, providing coherent X-rays (at the spatial diffraction limit, and close to the temporal transform limit) in a uniformly spaced train of pulses with programmable repetition rates up to 1 MHz, and tunable photon energies from 0.25 to 5 keV. This advanced facility offers important new science opportunities and unique applications for nonlinear and multicolor X-ray science. This talk will highlight some of the important science opportunities presented by LCLS-II and prospects and plans for developing nonlinear and multicolor capabilities and science applications.