



Contribution ID: 849

Type: **Oral (Non-Student) / orale (non-étudiant)**

## Observation of Wakefields in Coherent Synchrotron Radiation at the Canadian Light Source

*Monday, June 15, 2015 4:45 PM (15 minutes)*

Synchrotron light sources routinely produce brilliant beams of light from the infrared to hard X-ray. Typically, the length of the electron bunch is much longer than the wavelength of the produced radiation, causing the electrons to radiate incoherently. Many synchrotron light sources, including the Canadian Light Source (CLS), can operate in special modes where the electron bunch, or structures in the electron bunch, are small enough that they radiate coherently, producing coherent synchrotron radiation (CSR). Using a Michelson interferometer and RF diodes at CLS, we observe structure in THz CSR which is due to the electromagnetic wake following the electron bunch. The RF diode measurements provide direct observations of the wakefields, and we compare against wakefield simulations. Given the complexity of the vacuum chamber geometry, the agreement between simulation and measurement is quite satisfactory.

**Primary author:** WURTZ, Ward (Canadian Light Source Inc.)

**Co-authors:** BILLINGHURST, Brant (Canadian Light Source Inc.); BARIBEAU, Cameron (Canadian Light Source Inc.); BIZZOZERO, David (Department of Mathematics and Statistics, University of New Mexico); BERGSTROM, Jack (Canadian Light Source Inc.); VOGT, Johannes (Canadian Light Source Inc.); WARNOCK, Robert (SLAC National Accelerator Laboratory); KRAMER, Stephen (Brookhaven National Laboratory); MAY, Tim (Canadian Light Source Inc.); BATTEN, Tonia (Canadian Light Source Inc.)

**Presenter:** WURTZ, Ward (Canadian Light Source Inc.)

**Session Classification:** M2-9 Advanced Instrumentation at Major Science Facilities: Accelerators (DIMP) / Instrumentation avancée dans des installations scientifiques majeures: accélérateurs (DPIM)

**Track Classification:** Instrumentation and Measurement Physics / Physique des instruments et mesures (DIMP-DPIM)