

Physics and Physical Oceanography Seminar

Development and pilot study of a terahertz phase-contrast sensor for measuring density

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DATE: Thursday, Nov 26, 2020

TIME: 3:30 pm

Place: Webex (link will be sent out)

ABSTRACT: Terahertz radiation lies between the microwave and infrared bands of the electromagnetic spectrum. It has been challenging to gain practical access to this frequency range because electronics are difficult to drive up in frequency past about 100 GHz, and photonics likewise challenging to drive down in frequency into the THz range. This has led to the so-called "THz gap", one of the last frontiers of photonics research. Over the past 25 years, our ability to make use of these frequencies has expanded with the advent of the ultrafast laser. This has paved the way for new applications in fundamental time-resolved physics and non-destructive evaluation. In this talk, I will explore how THz technology can be used for industrial applications, competitive with X-ray scanning technology, without the associated health concerns. The UNBC THz research group has been at the forefront, leading industrial applications development for sensing and imaging of engineered wood products exploiting THz technology. I will review background and the core strengths of THz technology for industrial applications generally, recent technological developments will be discussed, and the path to a commercial sensing platform will be described. The results of a 2019 pilot at West Fraser's West Pine Mill will be presented, highlighting the unexpected challenges associated with piloting cutting-edge technology in real manufacturing environments, taking lab-based Physics to the manufacturing floor of a mill.

BIO: Matt Reid received his Ph.D. in the department of Electrical and Computer Engineering at the University of Alberta, Edmonton, AB, Canada in 2005. In 2005, he joined the department of Physics at the University of Northern British Columbia and is now a Professor in that department, leading the THz research laboratory. His main research interests are in the area of high-field THz nonlinear optics, industrial applications of THz technology, and nonlinear optics of semiconductor surfaces.

ALL ARE WELCOME!