



*Système de transmission Nortel WDM OC-192,
Laboratoire de Communications Optiques ÉTS*

Photonics at ÉTS

The main objective of the photonics research program at ÉTS is to investigate promising advanced components and signal processing technologies such as electronic dispersion compensators and microstructured-fiber devices, and to analyze their impact on the performance, architecture and management (at the physical layer level) of future optical transmission systems and networks. Part of the program looks at novel network architectures based on advanced modulation and electronic pre-compensation techniques and explores the metrology, control and planning issues in optical networks based on these technologies. Passive optical networks (PON) are also among the research areas of interest. The research program in this area includes the development of a PON test bed. This test bed supports exploratory research on methods for monitoring and troubleshooting point-to-multipoint (P2MP) passive optical networks. Another part of the program is related to the development of advanced photonics devices, both from a component perspective and from a control perspective. One research orientation is the application of novel microstructured fibers to multiple function devices, targeting specific applications where microstructured fibers have a competitive edge compared to conventional fibers. Another research orientation is related to photonic devices as intelligent network elements, equipped with embarked electronics and advanced control, for wavelength-reconfigurable optical networks. Such network elements require standardized, real time remote control and self-recognition of other network elements to optimize their own parameters. The approach aims at filling these needs using Web services. The research also targets the experimental study of the dynamics of such reconfigurable optical networks, including transient behavior and network instabilities.

The photonics lab infrastructure at ÉTS includes a multi-span OC-192 WDM transmission test bed composed of 8 WDM transmitters and receivers, coupled to an optical line system including optical amplifiers and dispersion compensating modules through multiplexers and demultiplexers. The setup also includes a ROADM with adjustable switching times, OADMs modules and can operate in recirculating loop mode, thus allowing the simulation of wavelength-reconfigurable optical transmission links from metro to long haul range. This complete WDM physical layer test bed at 10 Gb/s, a major industrial infrastructure (donated by Nortel) which was completed with governmental research funds, enables experimental evaluation and testing from the component to the network level in a real-world environment. In line with ÉTS' mission of being "An Engineering School for the Industry", this infrastructure is available for use by the industry on request.

CHRISTINE TREMBLAY AND VÉRONIQUE FRANÇOIS
(514) 396-8532 (514) 396-8800 x7730