KOÇ UNIVERSITY

Science – Math Seminar

Speaker: Hilmi Volkan Demir
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Date: Thursday, Dec. 16, 2004
Time: 16:45 (Tea and cookies will be served at 16:30)
Place: Science building, Room Z42
Title: Multifunctional Integrated Quantum Photonic Switches

Abstract:

On-chip integration of optoelectronic components and incorporation of quantum-confined structures enable the realization of new photonic device concepts to offer multiple functionalities on a single chip. One such device concept that we would like to introduce in this talk is the multifunctional integrated quantum photonic switches.

Traditional optical-electronic-optical (o-e-o) conversion in current optical networks requires propagating high-speed electrical signals through cascaded discrete electronic and optoelectronic components. This increases the cost, size, power consumption, and heat dissipation. For o-e-o conversion without the use of conventional electronics, we present novel photonic switching architectures that confine high-speed electrical signals within the quantum structures of the integrated optoelectronic circuits to avoid the difficulties of ordinary o-e-o conversion.

In this talk, we will present an overview of our research activities on the idea of on-chip integration and/or incorporation of quantum-confined nano-structures at NanoTR with a focus on the integrated photonic switching platforms. During the talk, we will describe a selected set of different implementations of our high-speed, low-power photonic switches along with a theoretical framework of their underlying physics and experimental characterization.

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