Abstract Submitted for the MAR06 Meeting of The American Physical Society

Photonic digitizing by laser crossing in thin-film semiconductors CHINTHAKA LIYANAGE¹, ARTUR ERLACHER, BRUNO ULLRICH, Bowling Green State University, NATALIA DUSHKINA, Millersville University — During the last two years, we developed a straightforward laser modulation concept, which has the potential to be employed in similar ways as microelectromechanical systems (MEMS). The concept is realized by crossing two laser lines in a semiconducting thinfilm on glass, i.e., by switching one of the beams, one achieves a clearly resolved (up to 30%) modulation of the other beam. In case of thin-film GaAs response times in the picosecond range are possible. We investigated the transmission mode of the modulation switch and demonstrated that the GaAs/glass interface exhibits a more effective switch as the GaAs film itself. The experiments have been carried out at room temperature with moderate laser powers on the order of 10 mW. We studied also the influence of polarization on the modulation characteristics in transmission and reflection using birefringent CdS samples. We observed that polarization variations of the green laser varies the modulation amplitude of the red transmitted and reflected ray, paying the way for polarization sensitive all-optical cross connects (OXCs) operating in the THz regime.

¹presenter

Natalia Dushkina Millersville University

Date submitted: 12 Jan 2006

Electronic form version 1.4