Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

A highly efficient and broadband photonic circular polarizer in optical range M.H ALIZADEH, Boston Univ — Miniaturization of bulky optical devices to micro and nano scales, has been at the forefront of cutting-edge research in the photonics community. The core idea of this line of research is to move towards ever smaller photonic components that can function even more efficiently than their bulky counterparts. One of such optical elements are Quarter Wave Plates, which convert a linearly polarized light to a circularly polarized light. Upon realization of nanoscale circular polarizers, they would find immediate applications in various areas, from Quantum information processing to nanoscale integrated chips and on-chip photonic communications. In this context, we present a novel nanosized photonic element, that can function as a circular polarizer in the visible range of spectrum and with very high efficiency. More specifically, we demonstrate that when light impinges on two closely fabricated silicon nanowires, the optical modes of these structures interact and the subsequent lifting of degeneracy of the degenerate fundamental modes of subwavelength nanowires, induces a phase shift in the modes and converts the incident linearly polarized light to a circularly polarized one.

Hossein Alizadeh
Boston Univ

Date submitted: 11 Nov 2016 Electronic form version 1.4