

Abstract Submitted  
for the MAR12 Meeting of  
The American Physical Society

**How and why a magnetized quantum wire can act as an optical amplifier** MANVIR KUSHWAHA, Rice University — The fundamental issues associated with the magnetoplasmon excitations are investigated in a quantum wire characterized by a confining harmonic potential and subjected to a perpendicular magnetic field. Essentially, we embark on the device aspects of the intersubband collective (magnetoroton) excitations which observe a negative group velocity between the maxon and the roton. The computation of the gain coefficient suggests an interesting and important application: the electronic device based on such magnetoroton modes can act as an optical amplifier.<sup>1</sup>

<sup>1</sup>M.S. Kushwaha, J. Appl. Phys. **109**, 106102 (2011).

Manvir Kushwaha  
Rice University

Date submitted: 17 Oct 2011

Electronic form version 1.4