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.¹