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When a magnetized quantum wire can act as an "active" laser medium MANVIR KUSHWAHA, University of Puebla, Mexico — We report on the theoretical investigation of magnetoplasmon excitations in a quantum wire characterized by a confining harmonic potential and in the presence of a perpendicular magnetic field. The problem involves two length scales: $l_0 = \sqrt{\hbar/m^*\omega_0}$ and $l_c = \sqrt{\hbar/m^*\omega_c}$, which characterize the relative strengths in the interplay of confinement and the magnetic field. We embark on the charge-density excitations within a two-subband model in the framework of Bohm-Pines' random-phase approximation. The main focus of our study is the (intersubband) magnetoroton excitation which changes the sign of its group velocity twice before merging with the respective single-particle continuum. We analyze the terms and conditions within which the magnetoroton excitation persists in the quantum wires. It is suggested that the electronic device based on such magnetoroton modes can act as an *active* laser medium.

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