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Theory of plasmon excitations in coaxial cylindrical geometries: finite magnetic field MANVIR KUSHWAHA, Institute of Physics, University of Puebla, Mexico, BAHRAM DJAFARI-ROUHANI, Department of Physics, University of Science and Technology of Lille, France — We report on a theoretical investigation of the plasmon propagation in the coaxial cylindrical geometries using Green's function (or response function) theory in the presence of an applied axial magnetic field ($\vec{B} \parallel \hat{z}$). Green's function theory generalized to be applicable to such quasi-one dimensional (1D) systems enables us to derive explicit expressions for the corresponding response functions (associated with EM fields), which can in turn be used to compute numerous physical properties of the system under consideration. As an application, we present several illustrative examples on the dispersion characteristics of the confined and extended magnetoplasmons in the single- and double-interface structures. These dispersive modes are also substantiated through the computation of local as well as total density of states (DOS). It is found that, unlike the zero-field case, the magnetoplasma propagation is nonreciprocal with respect to the sign of the index m of the Bessel functions involved. We also briefly clarify some delusive traces of the edge magnetoplasmpons for a plasma shell embedded between two identical or unidentical dielectrics. Our theoretical framework can also serve as a powerful technique for studying the intrasubband plasmons and magnetoplasmons in the emerging multiwall carbon nanotubes.

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