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Surface plasmon excitations in multicoaxial metamaterial cables: Zero magnetic field BAHRAM DJAFARI-ROUHANI, University of Science & Technology of Lille, MANVIR KUSHWAHA, Rice University — By using an elegant response function theory, which does not require matching of the messy boundary conditions, we investigate the surface plasmon excitations in the multicoaxial cylindrical cables made up of negative-index metamaterials in the absence of an applied magnetic field. The multicoaxial cables with *dispersive* metamaterial components exhibit rather richer (and complex) plasmon spectrum with each interface supporting two modes: one TM and the other TE for (the integer order of the Bessel function) $m \neq 0$. The cables with *nondispersive* metamaterial components bear a different tale: they do not support simultaneously both TM and TE modes over the whole range of propagation vector. The computed local and total density of states enable us to substantiate spatial positions of the modes in the spectrum.[1] Such quasi-one dimensional systems as studied here should prove to be the milestones of the emerging optoelectronics and telecommunications systems.

[1]M.S. Kushwaha and B. Djafari-Rouhani, J. Opt. Soc. Am B **27**, 605 (2010).

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