

Towards more general constitutive relations for metamaterials: a checklist to rule out inconsistent formulations

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When the period of unit-cells constituting metamaterials is no longer much smaller than the wavelength, local homogenization material laws fail to properly describe the propagation of light within [1]. By introducing nonlocal material parameters, this insufficiency could be lifted [2]. We introduce a list of several formulations. Therefore, a check process was established, that allowed us to conclude which formulations are correct or not. We discuss the additional interface conditions and the reflection and transmission coefficients from a slab for the different formulations and compared those to the response of an actual structure by using the Fourier Modal Method (FMM) [3].

References

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