Homogenization of the time–harmonic Maxwell equations in general periodic microstructures

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Inspired by new experimental observations, homogenization of the time-harmonic Maxwell equations in periodic meta-materials has been an active field of research in the last 20 years. We contribute with a study of periodic meta-materials with period $\eta > 0$ consisting of perfectly conducting microstructures and void space. Most of the known results treat a microstructure with a particular topology. By contrast, we discuss the homogenization of Maxwell's equations for a general class of microstructures. The topological characteristics of the medium determine the structure of the macroscopic equations as well as the transmission properties of the effective medium.

References

[1] B. Schweizer and M. Urban, *Effective Maxwell's equations in general periodic microstructures*, preprint