# Article information:

Band Gaps in Metamaterial Plates: Asymptotic Homogenization and Bloch-Floquet Approaches | SpringerLink  
<https://linkspringer.53yu.com/article/10.1007/s10659-022-09879-3>

# Article summary:

1. Asymptotic homogenization is a mathematical tool used to describe the macroscopic behavior of periodically heterogeneous linearly elastic bodies.

2. The article studies the asymptotic behavior of metamaterial plates when their thickness and heterogeneity size tend to zero, using both asymptotic homogenization and Bloch-Floquet approaches.

3. Locally resonant metamaterials can prevent the propagation of elastic waves in some frequency ranges, known as band gaps, which can be determined through numerical dispersion analyses or asymptotic homogenization.

# Article rating:

Appears well balanced: The article presents the information in a reliable and balanced way, without biases and prejudices. The claims made in the article are well supported and, where applicable, all sides of the argument are given opportunity to present their point of view. The article appears trustworthy and reliable.

# Article analysis:

The article provides a comprehensive overview of the use of asymptotic homogenization and Bloch-Floquet approaches to study the static effective behavior of periodic plates with respect to their thickness and heterogeneity size. The authors provide a detailed explanation of how these methods can be used to study the low frequency dynamic behavior of metamaterial plates, which act like locally resonant metamaterials (LRM). The article also discusses how band gaps in LRM can be determined through numerical dispersion analyses or asymptotic homogenization.

The article is well written and provides an in-depth analysis of the topic at hand. It is clear that the authors have done extensive research on this topic and have provided reliable evidence for their claims. Furthermore, they have presented both sides equally by discussing both numerical dispersion analyses and asymptotic homogenization for determining band gaps in LRM. There are no biases present in the article nor any promotional content or partiality towards one side over another. All possible risks associated with this topic are noted throughout the text, making it a trustworthy source for further research on this subject matter.

# Topics for further research:

* Metamaterial plates dynamic behavior
* Asymptotic homogenization for band gaps
* Numerical dispersion analysis
* Locally resonant metamaterials
* Low frequency dynamic behavior
* Static effective behavior of periodic plates

# Report location:

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