# Article information:

Tunable, reconfigurable, and programmable metamaterials - Bao - 2020 - Microwave and Optical Technology Letters - Wiley Online Library  
<https://onlinelibrary.wiley.com/doi/full/10.1002/mop.32164>

# Article summary:

1. Electromagnetic (EM) metamaterials have been developed rapidly and can be tailored to achieve unique properties.

2. Metasurfaces are two-dimensional metamaterials with advantages such as subwavelength thickness, flexibility, and the ability to induce abrupt phase and amplitude changes.

3. Programmable metamaterials have been developed which allow for wave-based information processing on physical levels in real time.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article “Tunable, Reconfigurable, and Programmable Metamaterials” by Bao is a comprehensive overview of the development of metamaterials from their initial concept to their current applications in various fields. The article provides an extensive review of the different types of metamaterials, including 3D metamaterials, 2D metasurfaces, tunable and reconfigurable metamaterials, and programmable metamaterials. It also discusses the various active components used in these materials and how they can be tuned or reconfigured to achieve desired functions.

The article is generally reliable and trustworthy due to its comprehensive coverage of the topic and its use of reputable sources for evidence. However, there are some potential biases that should be noted. For example, the article does not discuss any potential risks associated with using these materials or any counterarguments that may exist against their use. Additionally, it does not present both sides equally; instead it focuses mainly on the positive aspects of using these materials without exploring any potential drawbacks or limitations that may exist. Furthermore, some claims made in the article are unsupported by evidence or missing points of consideration which could lead readers to draw incorrect conclusions about certain topics discussed in the article.

In conclusion, this article provides a comprehensive overview of tunable, reconfigurable, and programmable metamaterials but should be read with caution due to potential biases present in its content.

# Topics for further research:

* Potential risks of metamaterials
* Limitations of metamaterials
* Counterarguments against metamaterials
* Active components of metamaterials
* Tuning and reconfiguring metamaterials
* Programmable metamaterials applications

# Report location:

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