

**REVIEW OF THE PAPERS ON METAMATERIALS APPEARED ON PHYSICAL
REVIEW LETTERS IN THE PERIOD 2000-2008**

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SUMMARY

In this document we review the papers appeared in the leading physical journal Physical Review Letters (PRL) in the period 2000-2008 concerning metamaterials. The review has been organized as follows.

At first all the papers appeared on PRL concerning metamaterials have been listed. The number of the papers per year is reported in Fig. 1, while the complete list is in Annex I to this document.

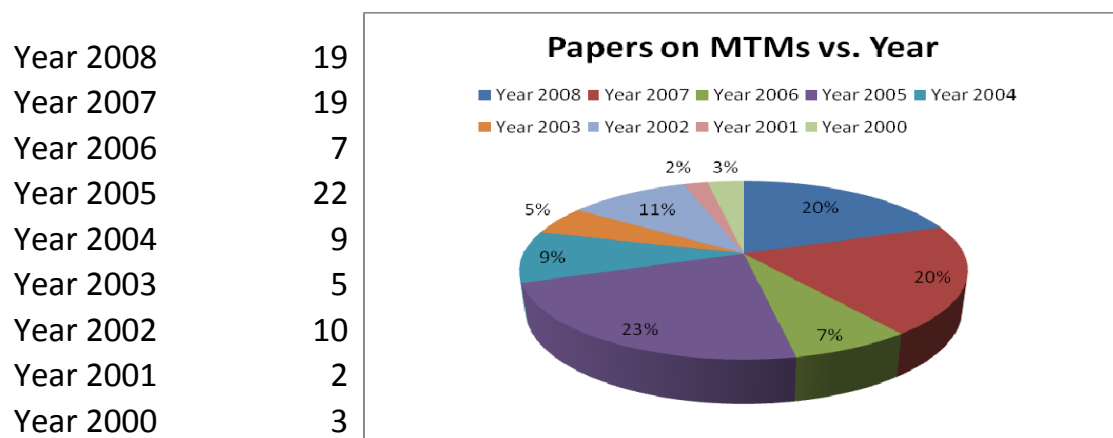


Fig. 1 Number of papers appeared on PRL in the years about metamaterials

The second part of the review has been devoted to analyze the papers on metamaterials and in particular those ones presenting effective material parameters dispersion curves. The percentage of the papers where effective parameter curves are presented is reported in Fig. 2. If only one of 2 most important conditions of locality (passivity and causality) is violated in the retrieved or calculated EMP the paper is marked in Annex I as the case of the incomplete convenience with the locality. If both passivity and causality are violated this paper is marked as completely non consistent with locality. It is clear that only the papers where the locality is fully respected (papers marked with “Yes”) can be recognized as correct ones in view of the content of Section 1. These papers make less than one half of all papers containing the frequency plots for EMP of

metamaterials. The percentage of papers where the basic physics is apparently violated in EMP of MTM is 53%.

The third part of the review has been devoted to a thorough analysis of the papers in which the constitutive parameter dispersion curves have been presented. In particular, consistency of the shown parameter dispersions has been checked. The summary of this activity is reported in Fig. 3. In a lot of papers lack of the needed information has been found.

The complete discussion about all the papers is reported in the Annex II to this document.

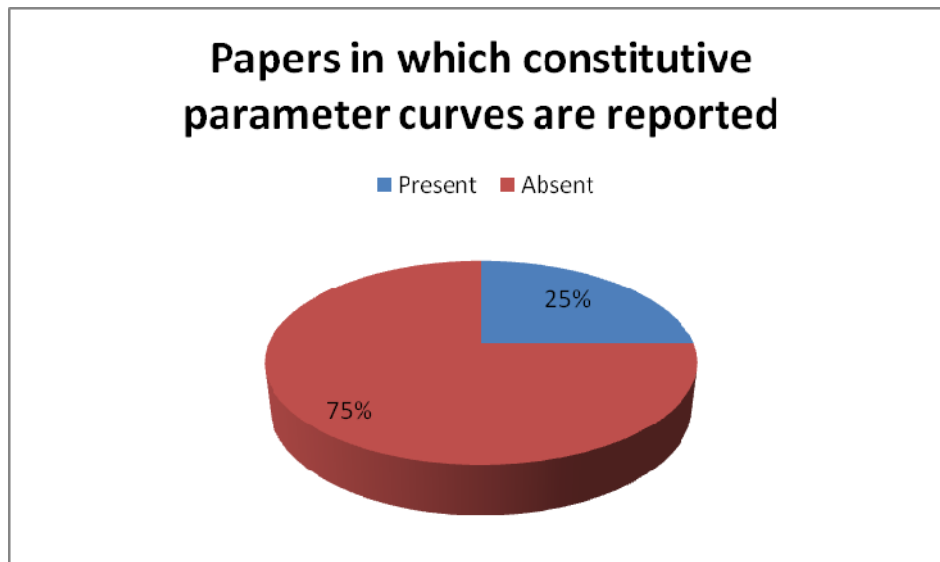


Fig. 2 Percentage of the papers reporting constitutive parameter dispersion curves.

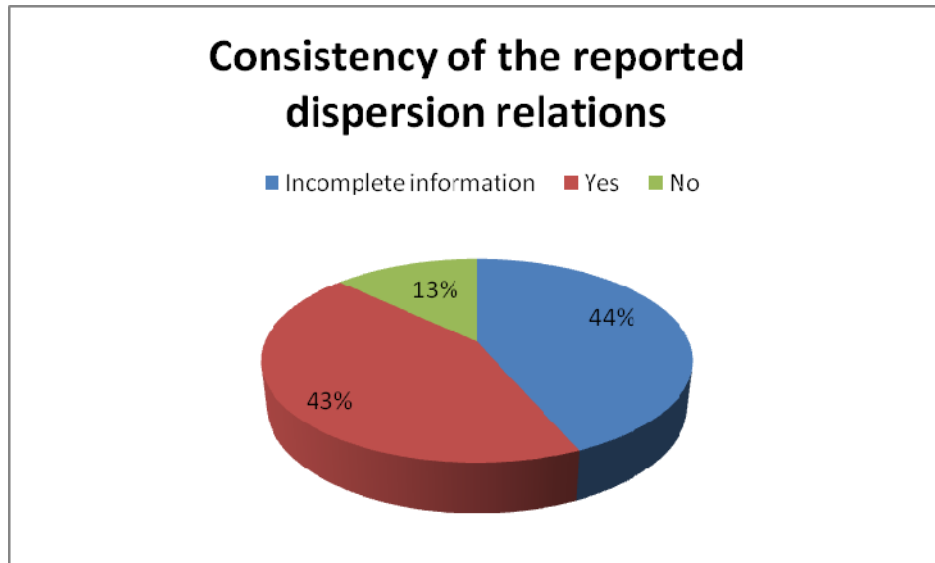


Fig. 3 Percentage of consistency of the constitutive parameter dispersion curves.

CONCLUSIONS

Metamaterials are gaining growing relevance as a topic in PRL during the years. The average number of the papers per year in the last 2-4 years is approaching 20.

One fourth of the papers on metamaterials in the period 2000-2008 presented the effective parameter dispersion curves.

Only in 43% of papers the curves presented allow one to understand that the EMP are physically meaningful.