Supplementary Materials

Comments on: "A perspective on impedance matching and resonance absorption mechanism for electromagnetic wave absorbing" by Hou et al. [Carbon 222 (2024) 118935]

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The main theories in the field of microwave absorption are completely wrong. Many papers from different perspectives have been published in a variety of journals. But the practice of using the wrong theories is continued in publications without mention these opposite views.

The purpose of this letter is through the comment on published paper to draw the attention of the researchers to the related papers. Although the wrong theories have dominated the field for a longtime, the problems can be corrected with simple principles covered in general physics at college level. The issues discussed are very important.

Background Information

Appendix Publications overturning established theories

1 Why the current theories have confused film with material

Yue Liu, Ying Liu, Michael G. B Drew, Wave Mechanics of Microwave Absorption in Films - Distinguishing Film from Material, Journal of Magnetism and Magnetic Materials, 2024, 593, 171850

Ying Liu, Xiangbin Yin, Michael G. B. Drew, Yue Liu, Reflection Loss is a Parameter for Film, not Material, **Non-Metallic Material Science**, 2023, 5(1): 38-48

2 Why the impedance matching theory is wrong

Ying Liu, Michael G. B. Drew, Yue Liu, A physics investigation on impedance matching theory in microwave absorption film—Part 2: Problem Analyses, **Journal of Applied Physics**, 2023, 134(4), 045304

Ying Liu, Yi Ding, Yue Liu, Michael G. B. Drew. Unexpected Results in Microwave Absorption – Part 1: Different absorption mechanisms for metal-backed film and for material, **Surfaces and Interfaces**, 2023, 40, 103022

3 Why the quarter wavelength theory is wrong

Liu Y, Liu Y, Drew MGB. A theoretical investigation of the quarter-wavelength model — part 2: verification and extension. **Physica Scripta 2022** , 97(1) **:** 015806.

Liu Y, Liu Y, Drew MGB. A theoretical investigation on the quarter-wavelength model — part 1: analysis. **Physica Scripta 2021** , 96(12) **:** 125003.

Ying Liu, Yue Liu, Drew M.G.B, A re-evaluation of the mechanism of microwave absorption in film Part 3: Inverse relationship, **Mater. Chem. Phys**. **2022**, 290, 126521.

Yue Liu, Ying Liu, Michael G. B Drew, The wave mechanics for microwave absorption film-Part 3: Film with multilayers, Preprint, Research Square, 13 Aug, 2023

A Theoretical Exploration of Impedance Matching Coefficients for Interfaces and Films, Applied Physics A, 2024, 130, 212, please see section 2.3

A physics investigation on impedance matching theory in microwave absorption film—Part I: Theory, **Journal of Applied Physics**, 2023, 134(4), 045303, Please see section III.

A physics investigation on impedance matching theory in microwave absorption film—Part II: Problem Analyses, **Journal of Applied Physics**, 2023, 134(4), 045304 Please see section III.

4 The correct absorption mechanism

Ying Liu, Yue Liu, Drew M.G.B, A re-evaluation of the mechanism of microwave absorption in film – Part 2: The Real mechanism, **Mater. Chem. Phys,. 2022**, 291, 126601.

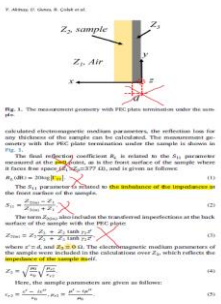
Yue Liu, Ying Liu, Michael G. B Drew, The wave mechanics for microwave absorption film-Part 1: A short review, Preprint, Research Square, 15 Aug, 2023

5 Another comment letter

Yue Liu, Ying Liu, Drew MGB, Corrections of common errors in current theories of microwave absorption caused by confusing film and material, Qeios, 2024/02/10

Citations

[1] Y. Akinay, U. Gunes, B. Çolak, T. Cetin, Recent progress of electromagnetic wave absorbers: A systematic review and bibliometric approach, ChemPhysMater, 2 (2023) 197-206.



[3] Nobe_laureate_Tasuku_Honjo, 90% of the opinions of the top journals of CNS are incorrect, in, https://dataverse.harvard.edu/file.xhtml?fileId=5112613&version=1.1#.

"First-class work often overturns the established conclusion, so it is unpopular. The reviewers cannot fully understand your work and will give you many negative comments, …. Articles catering to the trend of the times are easy to be accepted, otherwise, it will take a long time to get recognized" (2000)

and

"If your research can't overturn the established conclusion, science can't progress. Of course, your research will be not recorded in history. The academic world is conservative. If you don't write your paper according to the existing conclusion, it will be very difficult for your paper to be accepted, and you will suffer a lot, but the research that can survive in history is exactly this kind of research" (2013)

[4] S. Vazire, A toast to the error detectors, Nature, 577 (2020) 9.

Last month, I got a private Twitter message from a postdoc bruised by the clash between science as it is and how it should be. He had published a commentary in which he pointed out errors in a famous researcher's paper. The critique was accurate, important and measured – a service to his field. But it caused him problems: his adviser told him that publishing the criticism had crossed a line, and he should never do it again.

Scientists are very quick to say that science is self-correcting, but those who do the work behind this correction often get accused of damaging their field, or worse. My impression is that many error detectors are early-career researchers who stumble on mistakes made by eminent scientists, and naively think that they are helping by pointing out those problems – but, after doing so, are treated badly by the community.

[5] K.A. Aly, Comment on the relationship between electrical and optical conductivity used in several recent papers published in the journal of materials science: materials in electronics, Journal of Materials Science: Materials in Electronics, 33 (2022) 2889-2898.

ABSTRACT

Recently a series of papers have been published in the Journal of Materials Science: Materials in Electronics and also in other journals in which a relationship of the form $\sigma_{el} = 2knc/\alpha$, $\sigma_{el} = 2\lambda\sigma_{op}/\alpha$ and $\sigma_{el} = \lambda nc/(2\pi)$ (where λ is the free-space wavelength of light c is the speed of light in vacuum) between the electrical conductivity σ_{el} and optical conductivity σ_{1op}. The refractive index n, absorption coefficient α and the extinction coefficient k have been used and conclusions have been drawn from these relationships, including graphs of electrical and optical conductivity as a function of photon energy over a very wide range (e.g., 1–5.6 eV). In this comment, the difference between the optical (σ_{op}) and electrical (σ_{el}) conductivities is considered and analyzed through well-known textbook considerations; correct relations are given, and it is shown that the above expressions that have recently appeared in the literature are incorrect.

1 Introduction

This Comment addresses the use and validity of the relationships $\sigma_{el} = 2\lambda\sigma_{1op}/\alpha$, $\sigma_{el} = 2nkc/\alpha$ and $\sigma_{el} = \lambda nc/2\pi$ that have recently appeared in the literature and widely used in numerous papers in this journal as in [1–24] and also in other journals as in Optical and Quantum Electronics [25–32] Optical Materials [33–38], Journal of Alloys and Compounds [39–41], Journal of Physics and Chemistry of Solids [42, 43], Optics Communications [44–46], Journal of Inorganic and Organometallic Polymers and Materials [47–50], Ceramics international [51–56], Materials Research Innovations [57], Journal of Molecular Structure [58–65], Crystal Research Technology [66, 67], Journal of Modern Optics [68], Molecular Crystals and Liquid Crystals [69], Asian Journal of Information Technology [70], Optics and Laser Technology [71–74], Current Applied physics [75], Journal of Electronic Materials [76–81], Materials Research Express [82, 83], International Journal of Energy Research [84], Vacuum [85] Materials Today:

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https://doi.org/10.1007/s10854-021-07496-9

Proceedings [86–88], Materials Today Communications [89], and RSC Advances [90].

5 Note added in proofs

The author has noticed that another paper [122] that just became available during the proofs has also used the wrong equation in Eq. (19).

[8] J.N. Spencer, ΔG and ∂G/∂ξ, and the Physical Meaning of a Derivative (author's reply), Journal of Chemical Education, 76 (1999) 1188. DOI: 10.1021/ed076p1188.2

The author replies:

Twenty-five years have passed since I wrote the paper cited in Jemal's letter (*1*). I have reviewed an average of about a paper per year on this subject since then and have seen many other published papers on this topic. This seems to confirm the difficulty and confusion relating to changes in thermodynamic quantities for chemical reactions and in particular to the change in Gibbs energy. In fact, if it were not for a dimensional inconsistency encountered when relating ΔG° and the equilibrium constant, quite possibly the distinction between ΔG and $\Delta_r G$ would never have produced much interest. A check of my bookshelf of six current texts showed that all used the unit kJ for $\Delta_r H$, $\Delta_r S$, and $\Delta_r G$ for chemical reactions. Each text had a different explanation for why, when using the relation $\Delta G^\circ = -RT \ln K$, ΔG° must be given units of kJ mol^{-1}.

Liu Ying, Liu Yue, Drew Michael G. B. Natural mathematical derivation of the Gibbs-Duhem Equation related to ΔG and ∂G/∂ξ, **International Journal of Thermophysics, 2022**, 43, 73 doi: 10.1007/s10765-022-02998-y. Natural Mathematical Derivation of the Gibbs-Duhem Equation, 2022-03-10 | Preprint, Research Square, DOI: 10.21203/rs.3.rs-1061987/v1

[39] Y. Liu, M.G.B. Drew, Y. Liu, A physics investigation of impedance matching theory in microwave absorption film—Part 2: Problem analyses, Journal of Applied Physics, 134 (2023) 045304.

TABLE I. The values provided in Ref. 50 (*d*/mm, *f*/GHz) and the corrections have been included in parentheses. Energy is referenced to that of the incident beam.

d	f	RL/dB	$E_{11\text{-SHORT}}$	E_{AA}	E_{AM}	E_{loss2}
1.50	7.08	−16	0.034	0433	0.399	0.168
			(0.25)	(N/A)	(N/A)	(0.975)
2.30	4.58	−35	0.00044	0.370	0.370	0.260
			(0.00032)	(N/A)	(N/A)	(0.9997)
3.90	2.51	−17	0.019	0.347	0.366	0.287
			(0.020)	(N/A)	(N/A)	(0.980)

[64] T. Wang, R. Han, G. Tan, J. Wei, L. Qiao, F. Li, Reflection loss mechanism of single layer absorber for flake-shaped carbonyl-iron particle composite, Journal of Applied Physics, 112 (2012) 104903.

IV. CONCLUSION

In this work, we deeply investigated the reflection loss properties for the flake-shaped carbonyl-iron particle/paraffin composite. The relationship between the RL peak frequency and the absorber thickness was successfully explained by the quarter-wavelength cancellation. This absorbing mechanism was visually verified by measuring the reflection coefficient without and with a backed metal plate. Through analyzing and calculating the energy of the electromagnetic waves reflected from the air-absorber and absorber-metal plate interfaces, it was concluded that the intensity of the reflection loss peak is determined by the energy difference of the two waves. When the energy of the two reflected waves is equal, the intensity of the reflection loss peak is strongest, otherwise it becomes weak. The bandwidth formula of the reflection loss peak was derived from the quarter-wavelength cancellation mechanism and the bandwidth is sensitively related to the derivation of matching thickness to frequency.

[65] T. Wang, H. Wang, G. Tan, L. Wang, L. Qiao, The Relationship of Permeability and Permittivity at the Perfect Matching Point of Electromagnetic Wave Absorption for the Absorber Filled by Metallic Magnetic Particles, IEEE Transactions on Magnetics, 51 (2015) 2800405.

these complex permeability values, the corresponding complex permittivity values for $Z_{in} = 1$ can be read from Fig. 6, and the results are shown in Table I. We can see that the calculated permittivity is also much larger than the permeability and basically agrees with the measured permittivity. The large ratio of ε_r/μ_r for the complete absorption can be understood by the quarter-wavelength model. In the quarter-wavelength cancellation, the RL peak value is determined by the energy difference of the two waves reflected from the air–absorber interface and the absorber–metal plate interface. $Z_{in} = 1$ (RL $= -\infty$) corresponds to the same energy of the two reflected waves [16]. To ensure that the two waves cancel each other completely, a part of electromagnetic wave must be reflected from the air–absorber interface, so a certain ratio of ε_r to μ_r is necessary. In Table I, we can see that the measured complex permittivity is somewhat larger than the calculated value. The reason is explained as follows. When the contour map is developed, the Z_{in} is strictly fixed at 1. However, the perfect matching points we search are not the complete absorption strictly, but correspond to the finite RL values. This may result in the slight difference of the complex permittivity from the calculation and measurement.

[46] Z.-L. Hou, X. Gao, J. Zhang, G. Wang, A perspective on impedance matching and resonance absorption mechanism for electromagnetic wave absorbing, Carbon, 222 (2024) 118935.

$$d = \frac{(2m+1)c}{nf}\left(\frac{1}{4}+\Delta\right), (m = 1, 2, 3\ldots) \tag{7}$$

Here d is the thickness of an absorber, f is the resonant frequency, m is a natural integer, and n is the refractive index ($n = Re[\sqrt{\varepsilon_r\mu_r}]$). From Eq. (1), Eq. (2), and Eq. (7), Δ can be expressed as

$$\Delta = \frac{hSinh(t\pi)}{4\pi(1 - htCosh(t\pi))} \tag{8}$$

Here $h = \frac{(t - Tan\,\delta_m)}{(1 + tTan\,\delta_m)}$, $t = \frac{k}{n}$, and k is extinction coefficient. $Tan\,\delta_m$ is magnetic loss tangent. From Eq. (8), it can be seen that when $t = Tan\,\delta_m$, i.e., the $Tan\,\delta$ is equal to $Tan\,\delta_m$, $\Delta = 0$. When $t > Tan\,\delta_m$, there will be $\Delta > 0$. When $t < Tan\,\delta_m$, there will be $\Delta < 0$. Fig. 3b and 3c shows the distribution of the maximum electric field for non-magnetic materials and magnetic materials by CST simulation, respectively. It is observed that the resonance thickness of the material dominated by dielectric loss is greater than $\lambda/4$, while that of the material dominated by magnetic loss is less than $\lambda/4$. This phenomenon is also confirmed by standing waves in the external electric field of the material (Fig. 3e and 3f). The introduction of Δ in the resonant thickness allows to obtain a standing wave ratio (VSWR) equal to 1, when the reflection coefficient is equal to 0. For an EMW absorber plate without the metal backplate, there are also two interfacial reflections when the EMW is incident on the absorber. One is the interface between air and the absorbing material,

[70] S. Zhang, T. Wang, M. Gao, P. Wang, H. Pang, L. Qiao, F. Li, Strict proof and applicable range of the quarter-wavelength model for microwave absorbers, Journal of Physics D: Applied Physics, 53 (2020) 265004.

Neglecting higher-order terms and using further approximation of the hyperbolic sine function, one gets $2\beta d \approx (2k+1)\pi(1-\delta)$ when k is small. Hence,

$$d_{rev} = \frac{(2k+1)(1-\delta)c}{4f\sqrt{|\mu_r\varepsilon_r|}\cos\psi_2} \quad (9)$$

where $\delta = \tan\psi_1 \tan\psi_2$. This equation is the revised version of equation (7); when $\mu' >> \mu''$ and $\varepsilon' >> \varepsilon''$ ($\psi_1 \approx \psi_2 \approx 0$), it is totally equal to the quarter-wavelength model. Hence, this equation has a mechanism similar to the quarter-wavelength model, so we termed it the revised quarter-wavelength formula. Both the equations were derived from the phase match-

Other related citations

https://www.growkudos.com/publications/10.1088%252F1402-4896%252Fac1eb1/reader

[Ref. 1] "Can so many scientists have been wrong over the eighty years since 1925? Unhappily, yes. The mainstream in science, as any scientist will tell you, is often wrong. Otherwise, come to think of it, science would be complete. Few scientists would make that claim, or would want to. Statistical significance is surely not the only error in modern science, although it has been, as we will show, an exceptionally damaging one. Scientists are often tardy in fixing basic flaws in their sciences despite the presence of better alternatives. Think of the half century it took American geologists to recognize the truth of drifting continents, a theory proposed in 1915 by—of all eminently ignorable people—a German meteorologist. Scientists, after all, are human. What Nietzsche called the 'twilight of the idols,' the fear of losing a powerful symbol or god or technology, haunts us all"

Ziliak, S. T. and McCloskey, D. N. (2008). The cult of statistical significance: how the standard error costs us jobs, justice, and lives. University of Michigan Press

[Ref. 2] In a certain sense, the academic community resembles a faction-ridden "martial arts world," where academic authorities wield power akin to "sect leaders," and ordinary scholars lack the strength to challenge their viewpoints.

As the number of erroneous papers being published increases and more researchers follow the trend, everyone becomes a beneficiary, tacitly allowing these incorrect viewpoints to continue propagating.

— Science and Technology Daily, 2018-10-18, Page 01: Today's Headlines, Deception Spanning Over a Decade: Academic "Masters" in the Field of Stem Cells Fall from Grace

学术圈某种意义上像是个派系林立的"江湖"，学术权威如同"教主"一样，普通学者没有力量反抗其观点。

随着发表的错误论文越来越多，跟风研究的越来越多，大家都成了既得利益者，就默许了这些错误的观点继续流传下去。

———— 科技日报，2018-10-18 第 01 版：今日要闻，骗了全世界十余年 干细胞"学术大牛"走下神坛

https://baijiahao.baidu.com/s?id=1614619477235832974&wfr=spider&for=pc

https://baijiahao.baidu.com/s?id=1614619476870888302

https://www.rmzxb.com.cn/c/2018-10-18/2193148.shtml

[Ref. 3] "A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation

grows up that is familiar with it"
M. Planck, Scientific Autobiography and Other Paper, William & Norgate, London, 1950, pp. 33 -34.
https://zhuanlan.zhihu.com/p/407998797
https://zhuanlan.zhihu.com/p/363487648
[Ref. 4] "some scientists wondered how a questionable line of research persisted for so long … experts were just too timid to take a stand."
Harvard calls for retraction of dozens of studies by noted cardiologist, New York Times, http://www.staradvertiser.com/2018/10/16/news/harvard-calls-for-retraction-of-dozens-of-studies-by-noted-cardiologist/. 16 Oct 2018
[Ref. 5] S. Vazire, A toast to the error detectors, Nature 577(7788) (2020) 9.
https://doi.org/10.1038/d41586-019-03909-2
[Ref. 6] "Poster 1: Charles Townes and the Laser
[After] we had been at it for two years, Rabi and Kusch, the former and current chairman of the department — both of them Nobel laureates for work with atomic and molecular beams, and both with a lot of weight behind their opinions — came into my office and sat down. They were worried. Their research depended on support from the same source as did mine. 'Look,' they said, 'you should stop the work you are doing. It isn't going to work. You know it's not going to work. We know it's not going to work. You're wasting money. Just stop!'
But Townes had come to Columbia on tenure, so he knew he couldn't be fired for incompetence or ordered around. Nevertheless, the awesome weight of Rabi's reputation in particular — a one-time senior member of the Massachusetts Institute of Technology's legendary Radiation Laboratory set up by Vannevar Bush to develop wartime radar — must have been daunting. Such top brass cannot be defied lightly, and showing extraordinary courage, this junior faculty member stood his ground, and respectfully told his exalted colleagues that he would continue. Two months later (in April 1954), his experiment worked, and the maser (microwave amplification by stimulated emission of radiation) was born. Three years after that Arthur Schawlow, Townes' postdoc at Columbia, had moved to the Bell Laboratories, and their collaboration led to the optical version of the maser — the laser. Townes was awarded the Nobel Prize in Physics in 1964 for these discoveries [shared with Aleksander Prokhorov and Nikolai Basov (USSR), who developed the maser and laser independently]. Schawlow was awarded the Nobel Prize for Physics in 1981 for his work on laser spectroscopy."
Donald W. Braben – Scientific Freedom – The Elixir of Civilization, Wiley Interscience (2008)
[Ref. 7] "So we have little evidence on the effectiveness of peer review, but we have considerable evidence on its defects. In addition to being poor at detecting gross defects and almost useless for detecting fraud it is slow, expensive, profligate of academic time, highly subjective, something of a lottery, prone to bias, and easily abused."
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1420798
Peer review: a flawed process at the heart of science and journals
[Ref. 8] "Now pretty much every journal uses outside experts to vet papers, and papers that don't please reviewers get rejected … Weak-link thinking makes scientific censorship seem reasonable, but all censorship does is make old ideas harder to defeat. Remember that it used to be obviously true that the Earth is the center of the universe, and if scientific journals had

existed in Copernicus' time, geocentrist reviewers would have rejected his paper and patted themselves on the back for preventing the spread of misinformation. Eugenics used to be hot stuff in science—do you think a bunch of racists would give the green light to a paper showing that Black people are just as smart as white people? Or any paper at all by a Black author? (And if you think that's ancient history: this dynamic is still playing out today.) We still don't understand basic truths about the universe, and many ideas we believe today will one day be debunked. Peer review, like every form of censorship, merely slows down truth."

https://www.experimental-history.com/p/the-rise-and-fall-of-peer-review

The rise and fall of peer review

[Ref. 9] "Professor Braben argues that the introduction in the 1970s of the (peer) review of research proposals has led to a dearth of big scientific discoveries. The most radical ideas, he says, are unlikely to get funded because it is difficult to impress peers before they have been proven. ··· It (peer review) works well enough in the mainstream but it is at the margins where major discoveries are made, where people don't believe in the current wisdom and want to head off into dramatically different directions. To submit those ideas to peer review is disastrous"

https://www.timeshighereducation.com/news/kill-peer-review-save-civilisation/401457.article?storyCode=401457&site=cn

Kill peer review, save civilization

[Ref. 10] "On the off chance you do figure out a way to improve peer review without also making it worse, you can try convincing the nearly 30,000 scientific journals in existence to apply your magical method to the ~4.7 million articles they publish every year. Good luck!"

https://www.experimental-history.com/p/the-rise-and-fall-of-peer-review

The rise and fall of peer review

[Ref. 11] "We thus planned to make posting peer review documents the next stage in opening up our peer review process, ··· The final step was, in my mind, to open up the whole process and conduct it in real time on the web in front of the eyes of anybody interested. Peer review would then be transformed from a black box into an open scientific discourse. Often I found the discourse around a study was a lot more interesting than the study itself."

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1420798

J R Soc Med. 2006 Apr; 99(4): 178–182. doi: 10.1258/jrsm.99.4.178

Peer review: a flawed process at the heart of science and journals

[Ref. 12] "Beyond these considerations, the importance of many of the more recent developments cannot be evaluated objectively at this time. The history of mathematics teaches us that many subjects which aroused tremendous enthusiasm and engaged the attention of the best mathematicians ultimately faded into oblivion ... Indeed one of the interesting questions that the history answers is what survives in mathematics. History makes its own and sounder evaluations."

--Morris Kline, Mathematical Thought from Ancient to Modern Times, Oxford University Press, 1972, ISBN 0-19-506136-5

引申：历史是最公正的。历史反复证明，那些在当世喧嚣尘上的东西往往是主流学者刻意炒作的糟粕，而那些被当世打压的经常是真金白银。

Expansion: History serves as the ultimate arbiter. It consistently reveals that what is often overemphasized by the prominent scholars of an era is often merely the intentional

promotion of mediocrity, while that which is suppressed by the prevailing contemporary scholars often reveals itself to be authentic and of true value.

[Ref. 13]

梳理这段历史，会发现这些重大原始创新在刚面世时都遭到了业界的质疑和抵制，差点夭折。

这不是个例，浮栅晶体管、异质结、绝缘栅双极型晶体管（IGBT）、微机电系统（MEMS）、浸没式光刻等重大发明都遭到过抵制。

为什么这些发明一开始都不受待见呢？芯片的发展离不开持续的创新和超越，然而创新越大，对传统的叛逆和颠覆也越大，因而遭到传统势力的抵制就越大。

中国科学报，2023-09-16 第 3 版 读书

When delving into this historical period, it becomes apparent that these groundbreaking original innovations faced skepticism and opposition within the industry upon their initial emergence, nearly teetering on the brink of extinction. This phenomenon is not an isolated occurrence; major breakthroughs like floating-gate transistors, heterojunctions, insulated gate bipolar transistors (IGBTs), microelectromechanical systems (MEMS), immersion lithography, and others have also confronted resistance.

What prompted this initial lack of acceptance for these inventions? The advancement of semiconductor technology hinges on ongoing innovation and breakthroughs. However, the greater the innovation, the more it challenges and disrupts established norms, resulting in heightened resistance from traditional forces.

Published in China Science Daily, September 16, 2023, 3rd Edition, Book Review.

https://news.sciencenet.cn/dz/dzzz_1.aspx?dzsbqkid=39253

https://news.sciencenet.cn/dz/upload/2023/9/20239156508226.pdf

Our Publications on this subject

1. Yue Liu, Ying Liu, Drew MGB, Corrections of common errors in current theories of microwave absorption caused by confusing film and material, **Qeios**, **2024**/02/10, preprint, https://doi.org/10.32388/QQ1MFF; Corrections of Common Errors Associated with the Confusion between Film and Material in Current Theories of Microwave Absorption. Available at SSRN: https://ssrn.com/abstract=4797207 or http://dx.doi.org/10.2139/ssrn.4797207
2. Yue Liu, Michael G. B Drew,Ying Liu, A Theoretical Exploration of Impedance Matching Coefficients for Interfaces and Films, **Applied Physics A**, **2024**, 130, 212
3. Ying Liu, Michael. G.B. Drew, Yue Liu, Chapter 4: Fundamental Theory of Microwave Absorption for Films of Porous Nanocomposites: Role of Interfaces in Composite-Fillers, in Porous Nanocomposites for Electromagnetic Interference Shielding, Edited by: Sabu Thomas, Claudio Paoloni, Avinash R. Pai, **2024**, Elsevier, [978-0-323-90035-5_B978-0-323-90035-5.00013-1], pp. 59 - 90, https://doi.org/10.1016/B978-0-323-90035-5.00013-1
4. Yue Liu，Ying Liu，Michael G. B Drew，Wave Mechanics of Microwave Absorption in Films - Distinguishing Film from Material，**Journal of Magnetism and Magnetic Materials**，**2024**， 593, 171850 ； The wave mechanics for microwave absorption film – Part 2: The difference between film and material，Preprint, Research Square, 15 Aug, 2023, Supplementarial file
5. Yue Liu，Ying Liu，Michael G. B Drew, The wave mechanics for microwave absorption film-Part 1: A short review, Preprint, Research Square, 15 Aug, **2023**, scite_
6. Yue Liu，Ying Liu，Michael G. B Drew， The wave mechanics for microwave absorption film-Part 3: Film with multilayers, Preprint, Research Square, 13 Aug, **2023**,Supplementarial file, scite_
7. 刘颖， 刘跃，膜的微波吸收机理， 分子科学学报， **2023**，v.39; No.194(06) 521-527

8. Ying Liu, Kaiqi Yang, Yue Liu, Michael G. B Drew, The Shackles of Peer Review: Unveiling the Flaws in the Ivory Tower, arXiv, https://doi.org/10.48550/arXiv.2310.05966
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Why You Should Never Say "It's Just A Theory"

实验的目的是取得理论认知(科技英文听力资料，英汉对照）

现代科学研究欠缺的是对理论研究的重视

"只有实验验证了的理论才能被认可"的意思是不认可理论研究

化学不是实验科学、物理不是实验科学、正确的理论才是检验科学的唯一标准

错误不是毒蛇猛兽

垃圾文章的大量产出导致的问题不仅仅是虚假繁荣 （科技英语，英汉对照）

宁愿发表错误文章，也不发表垃圾文章

教材和期刊文献，前者更值得下大功夫研读

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Questions from Acaudio (with answers attached)

Fundamental theory of microwave absorption for films

Qeios 预印本平台的微波吸收纠错论文的 **YouTube** 视频介绍（包括中英文字幕）

一篇指出现行微波吸收理论错误的最新文章经历的拒稿历程记录（重点是第 **2** 和 **3** 节，跟踪敬请待续）

推翻现代研究领域微波吸收理论的文献导读（综述）**----** 重点是第 **3** 节

推翻现行微波吸收理论的主要论文

最新顶刊现行微波吸收理论文章和低级别刊物反对文章之间的比较（让历史做最终的裁决）

现代隐身材料（微波吸收）理论中的阻抗匹配系数理论错误了（最新发表的论文）

分析一篇微波吸收科普文章中的代表性错误

现行微波吸收理论混淆了膜和材料的区别（公开的学术擂台，接受挑战）

现代微波吸收领域的理论框架已经被新理论推翻