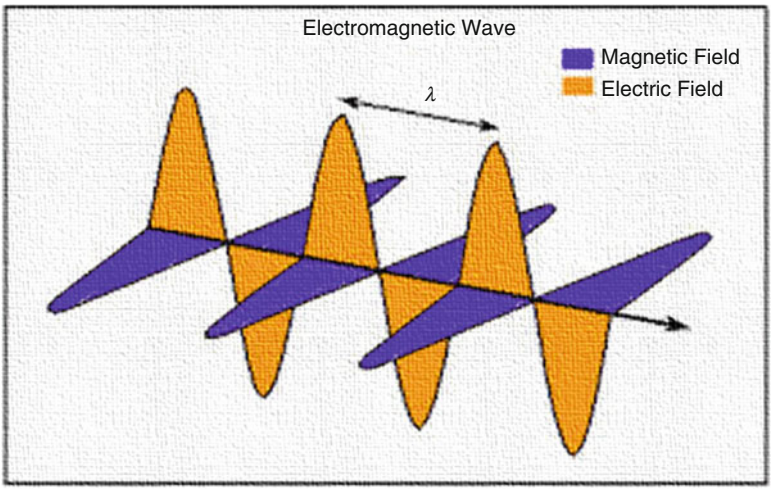
Scalar Wave Driven Energy Applications



$$\vec{\nabla} \times \vec{E} = \frac{\partial \vec{B}}{\partial t}$$

$$\nabla^2 \phi - \frac{1}{c^2} \frac{\partial^2 \phi}{\partial t^2} = 0$$

$$\nabla^2 \vec{A} - \frac{1}{c^2} \frac{\partial^2 \vec{A}}{\partial t^2} = 0$$

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To my son Sasha and grandson Darius,
as well as my daughter Natalie and
Dr. Natasha Zohuri

Preface

What is a "scalar wave" exactly? A scalar wave (hereafter SW) is just another name for a "longitudinal" wave. The term *scalar* is sometimes used instead because the hypothetical source of these waves is thought to be a "scalar field" of some kind, similar to the Higgs field for example.

There is nothing particularly controversial about longitudinal waves (hereafter LWs) in general. They are a ubiquitous and well-acknowledged phenomenon in nature. Sound waves traveling through the atmosphere (or underwater) are longitudinal, as are plasma waves propagating through space (i.e., Birkeland currents). LWs moving through the Earth's interior are known as "telluric currents." They can all be thought of as pressure waves of sorts.

SWs and LWs are quite different from a "transverse" wave (TW). You can observe TWs by plucking a guitar string or watching ripples on the surface of a pond. They oscillate (i.e., vibrate, move up and down or side-to-side) perpendicular to their arrow of propagation (i.e., directional movement). As a comparison, SWs/LWs oscillate in the same direction as their arrow of propagation.

Only the well-known (transverse) Hertzian waves can be derived from Maxwell's field equations, whereas the calculation of longitudinal SWs gives zero as a result. This is a flaw of the field theory because SWs exist for all particle waves (e.g., as plasma wave, as photon- or neutrino radiation). Starting from Faraday's discovery, instead of the formulation of the law of induction according to Maxwell, an extended field theory is derived. It goes beyond the Maxwell theory with the description of potential vortices (i.e., noise vortices) and their propagation as an SW but contains the Maxwell theory as a special case. With that the extension is allowed and does not contradict textbook physics.

William Thomson, who called himself Lord Kelvin after he had been knighted, already in his lifetime was a recognized and famous theoretical physicist. To him the airship seemed too unsafe and so he went aboard a steamliner for a journey from England to America in the summer of 1897. He was on the way for a delicate mission.

Eight years before his German colleague Heinrich Hertz had detected the electromagnetic wave (EW) in experiments in Karlsruhe and scientists all over the world had rebuilt his antenna arrangements. They all not only confirmed the wave as such, but also, they could show its characteristic properties. It was a TW, for which the electric and the magnetic field pointers oscillate perpendicular to the direction of propagation. This can be seen as the reason that the velocity of propagation is displays itself as field-independent and constant. It is the speed of light c.

Because Hertz had experimentally proved the properties of this wave, previously calculated in a theoretical way by Maxwell, and at the same time proved the correctness of the Maxwellian field theory. The scientists in Europe were just saying to each other: "Well Done!" While completely other words came across from a private research laboratory in New York: "Heinrich Hertz is mistaken, it by no means is a transverse wave but a longitudinal wave!"

Scalar waves also are called "electromagnetic longitudinal waves," "Maxwellian waves," or "Teslawellen" (i.e., Tesla waves). Variants of the theory claim that scalar electromagnetics, also known as scalar energy, is background quantum mechanical fluctuations and associated zero-point energies.

In modern-day electrodynamics (both classical and quantum), electromagnetic waves (EMW) traveling in "free space" (e.g., photons in the "vacuum") are generally considered to be TW. But then again, this was not always the case. When the preeminent mathematician James Clerk Maxwell first modeled and formalized his unified theory of electromagnetism in the late nineteenth-century, neither the EM SW/LW nor the EM TW had been experimentally proved, but he had postulated and calculated the existence of both.

After Hertz demonstrated experimentally the existence of transverse radio waves in 1887, theoreticians (e.g., Heaviside, Gibbs, and others) went about revising Maxwell's original equations; at this time, he was deceased and could not object. They wrote out the SW/LW component from the original equations because they felt that the mathematical framework and theory should be made to agree only with experiments. Obviously, the simplified equations worked—they helped make the AC/DC electrical age engineerable.

Then in the 1889 Nikola Tesla—a prolific experimental physicist and inventor of alternating current (AC)—threw a proverbial wrench into the works when he discovered experimental proof for the elusive electric SW. This seemed to suggest that SW/LW, as opposed to TW, could propagate as pure electric waves or as pure magnetic waves. Tesla also believed these waves carried a hitherto unknown form of excess energy he referred to as "radiant." This intriguing and unexpected result was said to have been verified by Lord Kelvin and others soon after.

Instead of merging their experimental results into a unified proof for Maxwell's original equations, however, Tesla, Hertz, and others decided to bicker and squabble over who was more correct because they all derived correct results. Nonetheless, because humans (even "rational" scientists) are fallible and prone to fits of vanity and self-aggrandizement, each side insisted dogmatically that they were right, and the other side was mistaken. The issue was allegedly settled after the dawn of the twentieth century when (1) the concept of the mechanical (i.e., passive/viscous)

Ether was purportedly disproved by Michelson-Morley and replaced by Einstein's Relativistic Space-Time Manifold, and (2) detection of SW/LWs proved much more difficult than initially thought; this was mostly because of the wave's subtle densities, fluctuating frequencies, and orthogonal directional flow. As a result, the truncation of Maxwell's equations was upheld. Nevertheless, SW/LW in free space are quite real.

Besides Tesla, empirical work carried out by electrical engineers (e.g., Eric Dollard, Konstantin Meyl, Thomas Imlauer, and Jean-Louis Naudin, to name only some) has clearly demonstrated SW/LWs' existence experimentally. These waves seem able to exceed the speed of light, pass through EM shielding (i.e., Faraday cages), and produce overunity—more energy out than in—effects. They seem to propagate in a yet unacknowledged counterspatial dimension (i.e., hyper-space, pre-space, false-vacuum, Aether, implicit order, etc.).

In addition to the mathematical calculation of SWs, this book contains a voluminous collection of material concerning the information's technical use of SWs; for example, if the useful signal and the usually interfering noise signal change their places, if a separate modulation of frequency and wavelength makes a parallel image transmission possible, if it concerns questions of the environmental compatibility for the sake of humanity (e.g., bioresonance, among others) or to harm humanity (e.g., electro-smog) or to be used as high-energy directed weapons—also known as Star Wars or the Strategic Defense Initiative (SDI)—as tomorrow's battlefield weapons.

Albuquerque, NM, USA B. Zohuri
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I also would like to take this opportunity to express my great appreciation and gratitude to Ms Cheyenne Stradinger, the Senior Librarian, and Ms Anne D. Schultz, the manager of Library Operation at the Engineering Library of the University of New Mexico–Albuquerque,. They constantly supported my research throughout by obtaining all the resource books and journals for me. Without their help this book could not have come to its final form as presented here.

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About the Author

Bahman Zohuri currently works for Galaxy Advanced Engineering, Inc., a consulting firm that he started in 1991 when he left both the semiconductor and defense industries after many years working as a chief scientist. After graduating from the University of Illinois in the field of physics and applied mathematics, he then went to the University of New Mexico, where he studied nuclear and mechanical engineering. He joined Westinghouse Electric Corporation after graduating; there he performed thermal hydraulic analysis and studied natural circulation in an inherent shutdown heat removal system (ISHRS) in the core of a liquid metal fast breeder reactor (LMFBR) as a secondary fully inherent shutdown system for secondary loop heat exchange. All these designs were used in nuclear safety and reliability engineering for a self-actuated shutdown system. Dr. Zohuri designed a mercury heat pipe and electromagnetic pumps for large pool concepts of a LMFBR for heat rejection purposes for this reactor during 1978 and received a patent for it.

Subsequently, he was transferred to the defense division of Westinghouse, where he oversaw dynamic analysis and methods of launching and controlling MX missiles from canisters. The results were applied to MX launch seal performance and muzzle blast phenomena analysis (i.e., missile vibration and hydrodynamic shock formation). Dr. Zohuri also was involved in analytical calculations and computations in the study of non-linear ion waves in rarefying plasma. The results were applied to the propagation of so-called soliton waves and the resulting charge collector traces in the rarefaction characterization of the corona of laser-irradiated target pellets.

As part of his graduate research work at Argonne National Laboratory, he performed computations and programming of multi-exchange integrals in surface and solid-state physics. He earned various patents in areas, such as diffusion processes and diffusion furnace design, while working as a Senior Process Engineer at various semiconductor companies (e.g, Intel Corp., Varian Medical Systems, and National Semiconductor Corporation). He later joined Lockheed Martin Missile and Aerospace Corporation as Senior Chief Scientist and oversaw research and development (R&D) and the study of the vulnerability, survivability, and both radiation and laser hardening of various components of the Strategic Defense Initiative, known as Star Wars.

This work included payloads (i.e., IR sensor) for the Defense Support Program, the Boost Surveillance and Tracking System, and the Space Surveillance and Tracking Satellite against laser and nuclear threats. While at Lockheed Martin, he also performed analyses of laser beam characteristics and nuclear radiation interactions with materials, transient radiation effects in electronics, electromagnetic pulses, system-generated electromagnetic pulses, single-event upset, blast, thermo-mechanical, hardness assurance, maintenance, and device technology.

He spent several years as a consultant at Galaxy Advanced Engineering serving Sandia National Laboratories, where he supported the development of operational hazard assessments for the Air Force Safety Center in collaboration with other researchers and third parties. Ultimately, the results were included in Air Force Instructions issued specifically for directed energy weapons operational safety. He completed the first version of a comprehensive library of detailed laser tools for airborne lasers, advanced tactical lasers, tactical high-energy lasers, and mobile/tactical high-energy lasers, for example.

Dr. Zohuri also oversaw SDI computer programs in connection with Battle Management C^3I and artificial intelligence and autonomous systems. He is the author of several publications and holds several patents, such as for a laser-activated radioactive decay and results of a through-bulkhead initiator. He has published the following works: *Heat Pipe Design and Technology: A Practical Approach* (CRC Press); *Dimensional Analysis and Self-Similarity Methods for Engineering and Scientists* (Springer); *High Energy Laser (HEL): Tomorrow's Weapon in Directed Energy Weapons, Volume I* (Trafford Publishing Company); and recently the book on the subject of *Directed-Energy Weapons and Physics of High-Energy Lasers* with Springer. He has published two other books with Springer Publishing Company: *Thermodynamics in Nuclear Power Plant Systems* and *Thermal-Hydraulic Analysis of Nuclear Reactors.* Many of them can be found in most universities' technical library, can be seen on the Internet, or ordered from Amazon.com.

Presently, he holds the position of Research Associate Professor in the Department of Electrical Engineering and Computer Science at the University of New Mexico–Albuquerque, and continues his research on neural science technology and its application in super artificial intelligence. Dr. Zohuri has published a series of book in this subject as well on his research on SWs; the results of his research are presented in this book.