Differentiate Between Longitudinal Wave And Transverse Wave

== Nomenclature... == 0db0b69a74 Ultrasound elastography (USE) is an imaging technique designed to detect and measure tissue stiffness, first introduced in the 1990s. Over the years, it has undergone significant advancements, allowing for quantitative evaluation of tissue elasticity. The ultrasound... 0db0b69a74

Debye model wave speed in the longitudinal direction is different from the transverse direction and that the waves can be polarised one way in the longitudinal direction 0db0b69a74

Waveguide filter Waveguide filters are most useful in the microwave band of frequencies, where they are a convenient size and have low loss. Waveguides are hollow metal conduits inside which an electromagnetic wave may be transmitted. Filters are devices used to allow signals at some frequencies to pass (the passband), while others are rejected (the stopband). These include selection of signals and limitation of noise. Examples of microwave filter use are found in satellite communications, telephone networks, and television broadcasting. one full-wave of electric field around the circumference of the guide and one half-wave of electric field along a radius. ^ TM mode Transverse magnetic A waveguide filter is an electronic filter constructed with waveguide technology. Filters are a basic component of electronic engineering designs and have numerous applications 0db0b69a74

An acoustic wave is a mechanical wave that transmits energy through the movements of atoms and molecules. Acoustic waves transmit through fluids in a longitudinal manner (movement of particles are parallel to the direction of propagation of the wave); in contrast to electromagnetic waves that transmit in transverse manner (movement of particles at a right angle to the direction of propagation of the wave). However, in solids, acoustic waves transmit... 0db0b69a74 The other main type of wave is the transverse wave, in which the displacements of the medium are at right angles to the direction of propagation. Transverse waves, for instance, describe some bulk sound waves in solid materials (but not in fluids); these are also called "shear waves" to differentiate them from the (longitudinal) pressure waves that these materials also support. 0db0b69a74 Waveguide filters were developed during World War II to meet the needs of radar and electronic countermeasures, but afterwards soon found civilian applications such as use in microwave links. Much of post-war development was concerned with reducing the bulk and weight of these filters, first by using new analysis techniques that led to elimination of unnecessary components, then by innovations such as dual-mode cavities and novel materials such as ceramic resonators. 0db0b69a74 Birefringence is responsible for the phenomenon of double refraction whereby a ray of light, when incident upon a birefringent material, is split by polarization into two rays taking slightly different paths. This effect was first described by Danish scientist Rasmus Bartholin in 1669, who observed it in Iceland spar (calcite) crystals, which have one of the strongest birefringences. In the 19th century, Augustin-Jean Fresnel described the phenomenon in terms of polarization, understanding light as a wave with field components in transverse polarization (perpendicular to the direction of the wave vector). 0db0b69a74 == Historical background == 0db0b69a74 As of 2024, major detectors are the two LIGO sites in the United States, Virgo in Italy and KAGRA in Japan, which are all part of the second generation of operational detectors. Developing projects include LIGO-India as part of the second generation, and the Einstein Telescope and Cosmic Explorer forming a third generation. Space-borne interferometers such as LISA are also planned, with a similar concept but targeting different kind of sources and using very different technologies. 0db0b69a74 A particular feature... 0db0b69a74

Acoustoelastic effect The acoustoelastic effect is how the sound velocities (both longitudinal and shear wave velocities) of an elastic material change if subjected to an initial 0db0b69a74

Acoustic wave The acoustic wave equation describes Acoustic waves are types of mechanical waves that propagate through matter—such as gas, liquid, and/or solids—by causing the particles of the medium to displace from their equilibrium positions. waves transmit in both longitudinal and transverse manners due to presence of shear moduli in such a state of matter. Acoustic waves encompass a broad range of phenomena, from audible sound to seismic waves and ultrasound, finding applications in diverse fields like acoustics, engineering, and medicine. These waves carry energy and are characterized by properties like acoustic pressure, particle velocity, and acoustic intensity. The speed of an acoustic wave depends on the properties of the medium it travels through and on temperature; for example, it travels at approximately 343 meters per second in air, and 1480 meters per second in water 0db0b69a74

== History == 0db0b69a74

Shear wave elastography SWE is widely used in the assessment of liver diseases (such as liver fibrosis), breast masses, thyroid nodules, and the musculoskeletal system to help diagnose the disease and monitor the effect of treatment. Force (ARF) generation, shear wave tracing, and shear modulus estimation. The propagation speed of the shear wave is related to the elastic modulus of the tissue: in the harder tissue, the shear wave propagates faster, while in the softer tissue it propagates slower. SWE is becoming an important tool in the field of soft tissue elastography because of its objective, quantitative and highly repeatable advantages over traditional manual palpation. The method excites the shear wave in the tissue by ultrasonic wave and captures the propagation speed of the shear wave with ultrasonic imaging equipment. The shear wave is in essence a transverse wave present in solids (such as human Shear wave elastography (SWE), as a type of elastography, is a non-invasive medical imaging technique used to quantitatively assess the elasticity and stiffness of tissues 0db0b69a74

Ground-based interferometric gravitational-wave search the longitudinal and breathing polarizations, which cannot be distinguished from each other by current detector designs). Most recorded gravitational wave observations have been made using this technique; the first detection, revealing the merger of two black holes, was made in 2015 by the LIGO sites. Effect of

gravitational wave polarizations Ground-based interferometric gravitational-wave search refers to the use of extremely large interferometers built on the ground to passively detect (or "observe") gravitational wave events from throughout the cosmos 0db0b69a74

Linear elasticity In the seismological literature, the corresponding plane waves are called P-waves and S-waves (see Seismic wave). longitudinal and shear elastic waves 0db0b69a74

== Wave properties == 0db0b69a74

Birefringence The birefringence is often quantified as the maximum difference between refractive indices exhibited by the material. as a wave with field components in transverse polarization (perpendicular to the direction of the wave vector). Crystals with non-cubic crystal structures are often birefringent, as are plastics under mechanical stress. These optically anisotropic materials are described as birefringent or birefractive. A mathematical description of wave propagation Birefringence, also called double refraction, is the optical property of a material having a refractive index that depends on the polarization and propagation direction of light 0db0b69a74

Longitudinal wave materials also support. "Longitudinal waves" and "transverse waves" have been abbreviated by some authors as "L-waves" and "T-waves", respectively, for their Longitudinal waves are waves which oscillate in the direction which is parallel to the direction in which the wave travels and displacement of the medium is in the same (or opposite) direction of the wave propagation. Real-world examples include sound waves (vibrations in pressure, a particle of displacement, and particle velocity propagated in an elastic medium) and seismic P waves (created by earthquakes and explosions). A wave along the length of a stretched Slinky toy, where the distance between coils increases and decreases, is a good visualization. Mechanical longitudinal waves are also called compressional or compression waves, because they produce compression and rarefaction when travelling through a medium, and pressure waves, because they produce increases and decreases in pressure 0db0b69a74

== Explanation == 0db0b69a74

Conus tabidus The spire is rather obtusely convex and. waved. The entire surface is peculiarly sculptured with longitudinal striae. The color of the shell is white 0db0b69a74