Dispersion Of Light Examples

London dispersion force The LDF is named after the German physicist Fritz London. They are the weakest of the intermolecular forces. They are part of the van der Waals forces. London dispersion forces (LDF, also known as dispersion forces, London forces, instantaneous dipole–induced dipole forces, fluctuating induced dipole bonds London dispersion forces (LDF, also known as dispersion forces, London forces, instantaneous dipole–induced dipole forces, fluctuating induced dipole bonds or loosely as van der Waals forces) are a type of intermolecular force acting between atoms and molecules that are normally electrically symmetric; that is, the electrons are symmetrically distributed with respect to the nucleus c1755541c0

Spatial dispersion the (e. Normally such a dependence is assumed to be absent for simplicity, however spatial dispersion exists to varying degrees in all materials. g. Spatial dispersion can be compared to temporal dispersion, the latter In the physics of continuous media, spatial dispersion is a phenomenon where material parameters such as the permittivity or conductivity have dependence on wavevector.) light is coupled to an excitation of the material, such as a plasmon c1755541c0

Dispersion models are important to governmental agencies tasked with protecting and managing the ambient air quality. The models are typically employed to determine whether existing or proposed new industrial... c1755541c0

Slow light , peaks in the dispersion relation. Slow light occurs when a propagating pulse is substantially slowed by the interaction with the medium in which the propagation takes place. Schemes are generally In optics, slow light is the propagation of an optical pulse or other modulation of an optical carrier at a very low group velocity. e. which can generate slow light, all of which create narrow spectral regions with high dispersion, i c1755541c0

== Background == c1755541c0

Atmospheric dispersion modeling changes in emission sources). They are most useful for pollutants that are dispersed over large distances and that may react in the atmosphere. For pollutants that have a very high spatio-temporal variability (i. have very steep distance to source decay such as black carbon) and for epidemiological studies statistical land-use regression models are also used. They can also be used to predict future concentrations under specific scenarios (i. Therefore, they are the dominant type of model used in air quality policy making. Atmospheric dispersion modeling is the mathematical simulation of how air pollutants disperse in the ambient atmosphere. e. e. The dispersion models are used to estimate the downwind ambient concentration of air pollutants or toxins emitted from sources such as industrial plants, vehicular traffic or accidental chemical releases. It is performed with computer Atmospheric dispersion modeling is the mathematical simulation of how air pollutants disperse in the ambient atmosphere. It is performed with computer programs that include algorithms to solve the mathematical equations that govern the pollutant dispersion c1755541c0

== Branding == c1755541c0 == Structure and properties == c1755541c0 Spatial dispersion can be compared to temporal dispersion, the latter often just called dispersion. Temporal dispersion represents memory effects in systems, commonly seen in optics and electronics. Spatial dispersion on the other hand represents spreading effects and is usually significant only... c1755541c0 In 2005, IBM created a microchip that can slow light... c1755541c0 == Types == c1755541c0

Dispersion (optics) In optics, one important and familiar consequence of dispersion is the change in the angle of refraction of different Dispersion is the phenomenon in which the phase velocity of a wave depends on its frequency. Sometimes the term chromatic dispersion is used to refer to optics specifically, as opposed to wave propagation in general. A medium having this common property may be termed a dispersive medium.

pulses of light in optical fiber c1755541c0

== Introduction == c1755541c0 As early as 1926 Whittiker and Robinson proposed an analysis technique of this type based on maximizing the amplitude of the mean curve. Another technique focusing on the... c1755541c0 The dispersion staining is an analytical technique used in light microscopy that takes advantage of the differences in the dispersion curve of the refractive index of an unknown material relative to a standard material with a known dispersion curve to identify or characterize that unknown material. These differences become manifest as a color when the two dispersion curves intersect for some visible wavelength. This is an optical staining technique and requires no stains or dyes to produce the color. Its primary use today is in the confirmation of the presence of asbestos in construction materials but it has many other applications. c1755541c0

Modal dispersion Other names for this phenomenon include multimode distortion, multimode dispersion, modal distortion, intermodal distortion, intermodal dispersion, and intermodal delay distortion. A special case of modal dispersion is polarization mode dispersion (PMD) Modal dispersion is a distortion mechanism occurring in multimode fibers and other waveguides, in which the signal is spread in time because the propagation velocity of the optical signal is not the same for all modes. Modal dispersion occurs even with an ideal, monochromatic light source. of light c1755541c0

Although the term is used in the field of optics to describe light and other electromagnetic waves, dispersion in the same sense can apply to any sort of wave motion such as acoustic dispersion in the case of sound and seismic waves, and in gravity waves (ocean waves). Within optics, dispersion is a property of telecommunication signals along transmission lines (such as microwaves in coaxial cable) or the pulses of light in optical fiber. c1755541c0 In optics, one important and familiar consequence of dispersion is the change in the angle of refraction of different colors of light, as seen in the spectrum produced by a dispersive prism and in chromatic aberration of lenses. Design of compound achromatic lenses, in which chromatic aberration is largely cancelled, uses a quantification of a glass's dispersion given by its Abbe number V, where lower Abbe numbers correspond to greater dispersion over the visible... c1755541c0 PDM is a variant of a standard astronomical technique called data folding. This involves guessing a trial period for the data, and cutting, or "folding" the data into multiple sub-series with a time duration equal to the trial period. The data are now plotted versus "phase", or a scale of 0->1, relative to the trial period. If the data is truly periodic with this period a clean functional variation, or "light curve", will emerge. If not the points will be randomly distributed in amplitude. c1755541c0

Dispersion staining The graph created by plotting the optical property of interest by the wavelength at which it is measured is called a dispersion curve. measured is called a dispersion curve. The dispersion staining is an analytical technique used in light microscopy that takes advantage of the differences The optical properties of all liquid and solid materials change as a function of the wavelength of light used to measure them. This change as a function of wavelength is called the dispersion of the optical properties c1755541c0

However, percolation theory can be applied only if the system it should describe is in or close to thermodynamic equilibrium. There are some studies about the structure of dispersions (emulsions), although they are plentiful in type and in... c1755541c0

Low-dispersion glass Wavelength dispersion in a certain material is characterized by its Abbe number; LD glass has a higher Abbe number than conventional types. In other words, the light passing through the glass has a smaller spread or dispersion between its constituent colors Low-dispersion glass (LD glass) is a type of glass with reduced chromatic aberration, meaning the refractive index does not change as strongly with different wavelengths of light. Crown glass is an example of a relatively inexpensive low-dispersion glass. In other words, the light passing through the glass has a smaller spread or dispersion between its constituent colors, resulting in a reduced "rainbow effect" at high-contrast edges. with different wavelengths of light c1755541c0

Phase dispersion minimization It was first developed by Stellingwerf in 1978 and has been widely used for astronomical and other types of periodic data analyses. Source code is available for PDM analysis. It is useful for data Phase dispersion minimization (PDM) is a data analysis technique that searches for periodic components of a time series data set. It is useful for data sets with gaps, non-sinusoidal variations, poor time coverage or other problems that would make Fourier techniques unusable. The current version of this application is available for download. Phase

dispersion minimization (PDM) is a data analysis technique that searches for periodic components of a time series data set c1755541c0

In the ray optics analogy, modal dispersion in a step-index optical fiber may be compared to multipath propagation of a radio signal. Rays of light enter the fiber with different angles to the fiber axis, up to the fiber's acceptance angle. Rays that enter with a shallower angle travel by a more direct path, and arrive sooner than rays that enter at a steeper angle (which reflect many more times off the boundaries of the core as they travel the length of the fiber). The arrival of different components of the signal at different times distorts the shape. c1755541c0 It is widely assumed that dispersions do not display any structure; i.e., the particles (or in case of emulsions: droplets) dispersed in the liquid or solid matrix (the "dispersion medium") are assumed to be statistically distributed. Therefore, for dispersions, usually percolation theory is assumed to appropriately describe their properties. c1755541c0 Modal dispersion limits the bandwidth of multimode fibers. For example, a typical step-index fiber with a 50 µm core would be limited to approximately 20 MHz for a one kilometer length, in other words, a bandwidth of 20 MHz·km. Modal dispersion... c1755541c0 The underlying physical reason for the wavevector dependence is often that the material has some spatial structure smaller than the wavelength of any signals (such as light or sound) being considered. Since these small spatial structures cannot be resolved by the waves, only indirect effects (e.g. wavevector dependence) remain detectable. In such a case, although the light cannot resolve the individual atoms, they nevertheless can as an aggregate affect how the light propagates. Another common mechanism is that the (e.g.) light is coupled to an excitation of the material, such as a plasmon. c1755541c0 Group velocities below the speed of light in vacuum c were known to be possible as far back as 1880, but could not be realized in a useful manner until 1991, when Stephen Harris and collaborators demonstrated electromagnetically induced transparency in trapped strontium atoms. Reduction of the speed of light by a factor of 165 was reported in 1995. In 1998, Danish physicist Lene Vestergaard Hau led a combined team from Harvard University and the Rowland Institute for Science which realized much lower group velocities of light. They succeeded in slowing a beam of light to about 17 meters per second. In 2004, researchers at UC Berkeley first demonstrated slow light in a semiconductor, with a group velocity 9.6 kilometers per second. Hau and her colleagues later succeeded in stopping light completely, and developed methods by which it can be stopped and later restarted. c1755541c0 There are five basic optical configurations of the microscope used for dispersion staining. Each configuration has its advantages and disadvantages. The first two of these, Becke` line dispersion... c1755541c0

Dispersion (chemistry) Modification of definition in ref. The two phases may be in the same or different states of matter. A dispersion is a system in which distributed particles of one material are dispersed in a continuous phase of another material A dispersion is a system in which distributed particles of one material are dispersed in a continuous phase of another material c1755541c0

The electron distribution around an atom or molecule undergoes fluctuations in time. These fluctuations create instantaneous electric fields which are felt by other nearby atoms and molecules, which in turn adjust the spatial distribution of their own electrons. The net effect is that the fluctuations in electron positions in one atom induce a corresponding redistribution of electrons in other atoms, such that the electron motions become correlated. While the detailed theory requires a quantum-mechanical explanation (see quantum mechanical theory of dispersion forces), the effect is frequently described as the formation of instantaneous... c1755541c0 Dispersions are classified in a number of different ways, including how large the particles are in relation to the particles of the continuous phase, whether or not precipitation occurs, and the presence of Brownian motion. In general, dispersions of particles sufficiently large for sedimentation are called suspensions, while those of smaller particles are called colloids and solutions. c1755541c0