

THEORIES BEHIND NON LINEAR OPTICS

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ABSTRACT

Nonlinear optics is the study of phenomena that occur as a consequence of the modification of the optical properties of a material system by the presence of light. Nonlinear optical phenomena are “nonlinear” in the sense that they occur when the response of a material system to an applied field depends in a nonlinear manner on the strength of the optical field. Typically, only laser light is sufficiently intense to modify the optical properties of a material system. In nonlinear optics, superposition principle no longer holds. The beginning of the field of nonlinear optics is often taken to be the discovery of second harmonic generation by Franken et al. shortly after the demonstration of the first working laser by Maiman in 1960.

Nonlinear optics provides the basis of many key technologies used today for providing radiation sources in various wavelength ranges from X-rays to the tetrahertz. Nonlinear optical technologies are usually used in combination with laser technology, and the main aspect is to shift or extend the limited wavelength range directly accessible by the laser source.

KEYWORDS: *Interatomic, Laser, Linear Optics, Nonlinear Optics, Intensity, Field Strength*