

Keywords

- › Resonance
- › Energy
- › Matter
- › Oscillation
- › Frequency

Resonance is the coordinated coupling of energy (stimulus) to matter (system), resulting in the smooth, rhythmic motion of matter according to its inherent oscillation dynamics.

The stimulus is the driving force that initiates and sustains the motion of the system. It can consist of various forms of energy, such as mechanical, sound or electromagnetic, that exist in a wave-like form.

The system must be capable of recurrent, to-and-fro motion around a resting point. The number of repetitions per unit of time of this type of motion (oscillation) is called frequency, expressed in cycles per second or Hertz. Each system has an intrinsic os-

cillation or resonance frequency, determined by its physical and chemical make-up.

It follows that the ease of oscillation of the system depends on the frequency of application of the stimulus.

In the case of magnetic resonance (MR), the stimulus is electromagnetic radiation and the system is a group of protons that oscillate between two discrete energy levels. Resonance is accomplished only if the frequency of the radiation matches the natural oscillation frequency of the protons. In such cases, there is efficient transfer of energy, i.e., rapid and without losses (as heat).



<http://www.springer.com/978-3-540-77999-5>

Clinical MR Imaging and Physics

A Tutorial

Chrysikopoulos, H.S.

2009, IX, 176 p., Softcover

ISBN: 978-3-540-77999-5