constructive and deconstructive interference

Constructive and destructive interference are phenomena that take place when several waves meet. The main difference between constructive and destructive interference is that constructive interference occurs when the displacements of the waves that meet are in the same direction, whereas destructive interference occurs when displacements of the waves that meet are in the opposite directions.

Principle of Superposition

Constructive and destructive interference occurs due to the principle of superposition. According to this principle, when several waves of the same type meet at a point, the resultant displacement at that point is the sum of the displacements due to each of the incident waves.

When two waves are meeting and the oscillations of the two waves are in the same stage, then we say the two waves are oscillating in phase. The phase difference between two waves that meet in-phase is a whole even-number multiple of pi (0, 2?, 4?,...). If the oscillations are at the opposite stages in the cycle, then we say that the waves are oscillating completely out-of-phase or in antiphase. The phase difference between two waves that are in antiphase is a whole odd-number multiple of pi (?, 3?, 5?,...).
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