

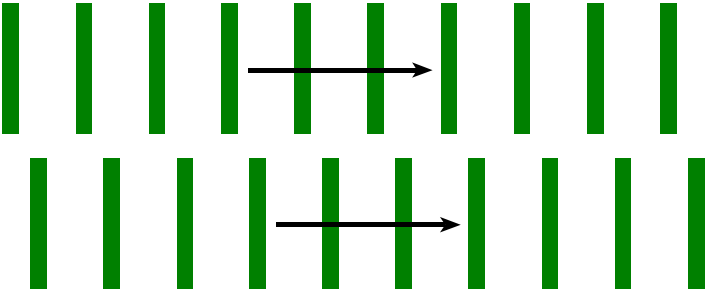
TAP 322- 6: Coherence

Here phase differences do not change over time.

Coherence

Two waves will only show stable interference effects if they have a constant unchanging phase difference. If so they are said to be **coherent**.

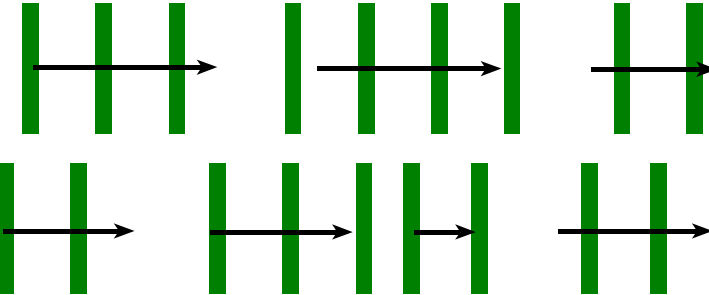
coherent waves with constant phase difference



The diagram shows two horizontal rows of green vertical bars representing wave pulses. The top row has 10 bars, and the bottom row has 10 bars. A horizontal arrow is drawn between the 4th and 6th bars of the top row, and another horizontal arrow is drawn between the 4th and 6th bars of the bottom row. The bars in both rows are perfectly aligned in phase, indicating a constant phase difference.

Atoms emit bursts of light waves. A burst from one atom is not in phase with a burst from another. So light waves from atoms are coherent only over quite short distances.

incoherent wave bursts with changing phase difference



The diagram shows two horizontal rows of green vertical bars representing wave pulses. The top row has three groups of bars: a group of 3 bars, a group of 4 bars, and a group of 2 bars. The bottom row has four groups of bars: a group of 2 bars, a group of 2 bars, a group of 3 bars, and a group of 2 bars. Horizontal arrows are drawn between the bars in each group, showing that the phase difference between the two rows varies from group to group, indicating incoherence.

Practical advice

This is provided here for use in the classroom

External reference

This activity is taken from Advancing Physics chapter 6, 12 O