Maxwell's Equations and Electromagnetic Waves I

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Waves on a string are reviewed and the general solution to the wave equation is described. Maxwell's equations in their final form are written down and then considered in free space, away from charges and currents. It is shown how to verify that a given set of fields obeys Maxwell's equations by considering them on infinitesimal cubes and loops. A simple form of the solutions is assumed and the parameters therein fitted using Maxwell's equations. The wave equation follows, along with the wave speed equal to that of light (3 x 10^8), suggesting (correctly) that light is an electromagnetic wave. The vector relationship between the electric field, the magnetic field and the direction of wave propagation is described.

00:00 - Chapter 1. Background
04:43 - Chapter 2. Review of Wave Equation
20:01 - Chapter 3. Maxwell's Equations
56:47 - Chapter 4. Light as an Electromagnetic Wave   □□□□□ : youtube.com □□□□□□□□□□Y aleCourses

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