

# Re: Photons

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joilly17@xxxxxxxxxxxxxx wrote:

Can someone please answer this question: A photon has an electric field and a magnetic field that oscillate at right angles to each other.

Not really. In a very real sense photons ARE magnetic and electric fields, they don't "have" them.

[Note that photons are intrinsically circularly polarized...]

But SR says that in any system moving at the speed of light all clocks are stopped. So how can a photon (moving at the speed of light) have oscillating fields?

You confused the issue you are trying to discuss by bringing up photons. Let me ignore the quantum aspects and just discuss light in classical electrodynamics.

A light wave oscillates with a definite frequency and wavelength in any inertial frame, but these properties are not intrinsic to the light wave because they depend on which frame one uses to look at the light. These inertial frames all move with speed less than  $c$  relative to each other.

It is not possible to consider things from "the frame in which the light is at rest" because there is no such frame. This was one of Einstein's essential insights. In the locally inertial frame of the light source, or of any detector, the light oscillates with definite frequency and wavelength, and that is sufficient.

Tom Roberts

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