Re: Is B just that part of E that does no work?

Source: http://sci.tech−archive.net/Archive/sci.physics/2007−07/msg01641.html

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- *Date*: Thu, 26 Jul 2007 08:59:58 −0700

On Jul 25, 11:25 pm, blackhead <larryhar...@xxxxxxxxxxxx> wrote:

> B and E are two fields that act on charge, with the former doing no work. So isn't B just that part of E which does no work? i.e. that part of E which is normal to the velocity, v, of a charge and so could be defined as E x v? So every E will have a B that is dependent upon the path taken by a charge through it.
>
> I want to calculate B for a straight wire using the above idea. I will calculate the delayed E at a point due to the moving electrons, and subtract that from E due to the stationary ions which should give zero since a stationary charge experiences no force in practise. The problem is why a moving charge, Q, experiences a force if E is zero there? I suspect it's because it's E will have an effect on the electrons in the wire because of the finite time it takes to effect them, which in turn generate an E that effects Q so that an E normal to v of Q is the net result.
>
> Is this going to be a waste of time, so that I will end up with something that conflicts with Maxwell's equations?
>
> Thanks in advance.

After reading the responses, some of my ignorance has been cleared up. E and B are orthogonal components of the E−M field, and so E being a part of B is nonsense. So my question should have been "Does the E and B of the E−M field depend upon v of q used to measure it?"

Take the case the E of an E−M field takes where there is a changing magnetic field. E depends upon the velocity of q, so that |E| is proportional to |v| with a direction along the path taken by q and so E is zero when q is static.

Is it not true that E depends also on the velocity of q through the EM field of a static Q distribution? So whereas it may have a static E when a static q is used, it takes on other Es depending upon the velocity of q used to measure it.

Thanks for your helpful comments in advance.

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