

# Re: Download a new book on quantum mechanics and relativity.

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**From:** Eugene Stefanovich (*eugenev\_at\_synopsys.com*)

**Date:** 10/04/04

Date: Mon, 04 Oct 2004 10:38:45 -0700

Bilge wrote:

> *Eugene Stefanovich:*

>

> *>My point was that AB experiment does not provide an unambiguous proof*

> *>that classical EM theory with potentials, gauges, etc. is the ONLY*

> *>correct theory. I hope, you agree with that.*

>

> *You are free to offer an alternative theory. It also does not say*

> *the classical theory is correct, since the potentials in classical*

> *E&M are artifacts of the formalism with no physical significance.*

> *The potentials take on meaning precisely because of quantum mechanics.*

Agreed.

> *You'll have a great deal of effort trying to find some alternative,*

> *since at no time is there a force on the electrons that changes their*

> *momentum.*

I see a challenge ahead of me, but I trust my theory can overcome that.

>

> *>If you do agree with that, then you should give me a benefit of a*

> *>doubt when I am trying to find a theory which describes certain*

> *>phenomena better than Maxwell's theory or QED.*

>

> *The benefit of the doubt ceased when you started misconstruing quotes*

> *you reference in order to engage in a semantics debate rather than stick*

> *to physics. If you do not understand why the Lorentz transforms apply*

> *universally to the things which live in spacetime in special relativity,*

> *that isn't my problem. I really think you know better, or at least you*

> *should know better.*

I understand well why "Lorentz transforms apply universally to the things which live in spacetime in special relativity". My point is that my theory does not live in spacetime, and my approach is

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different from Einstein's special relativity. Nevertheless, my approach is fully relativistic, in the sense I described in a few previous posts.

>  
> *I also am not inclined to give the benefit of the doubt to someone who*  
> *cannot (or willnot) express what they are proposing in terms which offer a*  
> *means of comparison to anything else. You have so far rejected any attempt*  
> *on my part to apply any concept related to E&M to your theory and you*  
> *refuse to do it yourself. You claim maaxwell's equations are wrong, yet*  
> *refuse to accept the differences.*

I am happy to discuss and compare experimentally observed consequences of both theories (though I agree that my approach is in its infancy, and description of accelerators or AB effect are currently beyond its reach). I am not happy when you try to apply language of classical EM theory to my approach. Each theory has its own vocabulary, and when you try to discuss my approach using words "fields" and "gauges" I resist. These words do not belong there.

> *Your theory violates gauss' law. I*  
> *can see why you're reluctant to admit that, but that isn't my problem.*

In the non-relativistic approximation the Gauss law is satisfied. The force acting between two stationary charges is

$$F = q_1 q_2 / r^2$$

If you integrate this force over closed surface surrounding one charge, you'll get a constant. I believe, this is the essence of the Gauss law. However, I do not count Gauss law as a fundamental law of nature. If it is violated in higher order relativistic or perturbation terms, I don't see a big problem with it.

>  
> *Why should I give you the benefit if the doubt after you posted several*  
> *responses accusing me of not having listed any experiments relevant to*  
> *your theory? You justed wasted my time responding to your reply in which*  
> *you feigned an interest in one of those experiments, but in which you*  
> *really have no interest.*  
>  
> *>I think I demonstrated that my approach can describe time evolution,*  
> *>while QED can't.*  
>  
> *No, I don't agree you've done that. The types of phenomena which you've*  
> *said you wish to describe aren't even physical. For example, onse such*  
> *phenomenon was the ``evolution" of the individual electron spins in*  
> *collision between electrons. But electrons are indistinguishable*  
> *particles, so it isn't even possible to talk about the interaction as*  
> *anything but a singlet or triplet state. The individual spin projections*  
> *are not observables. That's the reason for clebsh-gordon coefficients and*

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- > *tensor operators. The eigenstates of two spin 1/2's are an  $S=0$  singlet and*
- > *an  $S=1$  triplet. Even if the two particles are different, the spin*
- > *eigenstates of the system are a singlet and triplet. Go look at a rabi*
- > *diagram at the point on the diagram at which the applied external field*
- > *is zero.*

I disagree with you that spin projections of individual particles are not observables. Are you saying that momenta of individual particles also are not observable? That's what S-matrix tells us: how momenta and spins of constituents evolve from  $-\infty$  to  $+\infty$ . If what you say is correct, then we cannot say anything meaningful about a system of two spin 1/2 particles prepared with total spin  $S=0$  and total momentum  $P=0$ . If we regard as physical only total observables (total spin and momentum) then this system is trivial: both observables are conserved. In fact, there are also individual observables of particles which can be observed as well. Their non-trivial dynamics is described by Hamiltonian (or by the S-matrix in the asymptotic limits).

- >
- > *I told you a few times that I haven't discussed AB experiment in*
- > *my approach. I am sure, that such a description is possible. You*
- > *may disagree with that. If you think my approach does not merit*
- > *discussion until I provide full description of AB experiment, you should*
- > *wait for a while.*
- >
- > *You haven't provided any description. You're grasping at straws if*
- > *you think scattering from the solenoid or some residual field from*
- > *the solenoid looks like interference.*

Yes, I haven't provided any description of AB effect. I just told you that AB effect does not undermine my approach in any way.

Eugene.