

Re: Einstein's math and physical objects

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From: Todd (*nope_at_nospam.com*)

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"harry" <harald.vanlintel@epfl.ch> wrote in message
news:1105888400.022235.231360@c13g2000cwb.googlegroups.com...
> [Tod]:
> *"Let me avoid the acceleration by bringing about the final state in a
> somewhat different way. Imagine that the disks are at rest in frame B
> and
> the disks are not rotating. Diametrically opposite wires connect the
> disks
> as before. Frame B is moving in the positive x-direction relative to
> frame
> A. Thus, A sees the disks sliding in the positive x-direction, not
> rotating, and the wires parallel to the x-axis."*
>
> *Oh oh, I'm afraid you now messed up – for without rotation the wires
> are simply crossed for all observers.
> This isn't going to help...*
>
> *Harald*
>

I still think I'm right! But maybe you can explain where I'm going wrong.

I'm not sure what you're referring to when you say 'without rotation'.
There is no rotation initially, but there is rotation in the final state.

Again, the disks are initially sliding along the x-axis in frame A with no
rotation. The wires are strung between them parallel to the x-axis. Frame
B sees the disks and wires all at rest – no sliding and no rotation.

Now, we introduce the rotation. More precisely, we imagine that torques are
applied to the two disks _simultaneously_ in frame A_ so that the disks
obtain identical rotations simultaneously in frame A. No external torques
or forces are applied to the wires. The wires feel only their internal
stresses and the forces of attachment to the disks.

Imagine what happens in frame B. Due to relativity of simultaneity, the
disk that has the greater x-coordinate starts rotating first. In this frame

the disks are not sliding. So, it's just like you where holding the disks in front of you and turning one of the disks without turning the other. So, in frame B the wires will assume a simple crossed configuration. Once the other disk also begins to rotate in frame B, no further twisting of the wires will occur and the wires and disks simply maintain their crossed configuration while the whole thing rotates (from the point of view of B).

In frame A, the final configuration of the wires must be the Lorentz transform of the configuration in B. If I'm not mistaken, this will be the conical helix shape. Any points where the wires touch in B, they will also touch in A.

Todd