Re: Androcles and Draper resume Einstein 1905

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From: PD (*pdraper_at_yahoo.com*)
Date: 01/15/05

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Timo Nieminen wrote:
> *On Fri, 14 Jan 2005, Androcles wrote:*
>
> > *"Gregory L. Hansen" <glhansen@steel.ucs.indiana.edu> wrote:*
>
> > > *If I may butt in, I think Draper's point was that when K watches*
k
> > > *measure*
> > > *the length, he won't agree that it was a measurement of the*
length!
> > > *And*
> > > *vice versa. So when k gives K a measured length, K will say*
"Your
> > > *number*
> > > *is smaller than mine, but I don't know what the hell it is. I*
watched
> > > *you*
> > > *do it, and that's not how to measure a length."*
> > >
> > *That's fine, but k is carrying out an illegitimate procedure. I*
had
> > *previously*
> > *agreed with Paul that the measurement can only be carried out when*
> > *the rod to be measured and the measuring rod were relatively at*
rest.
> > *Observer K will not agree with observer k's guesstimate,*
> > *as you point out, but observer k himself will be uncertain.*
>
> *So, then you have agreed that only what is called in SR the "proper*
> *length" is to be accepted as the length of an object.*
>
> *The proper length being invariant in SR (and Galilean relativity as*
well),
> *the answer follows trivially that observers k and K agree that the*
proper
> *length of the rod is the same.*
>

Though this is the way it is commonly taught, I find this distasteful because it leads away from the main point: that length is defined by a procedure and is not an inherent property of an object. Or, said more generally, the distance between two events is not an inherent property of those two events.

What everyone can agree on is the spacetime interval, and that's what has physical meaning. For spacelike−separated events, there is a frame where the distance between these events happens to equal the interval, and that distance is what some folks call the "proper length". Said more colloquially and relevantly to the current case, there is a frame where the measured length of the rod happens to equal the interval, and that's what's sometimes called the "proper length".

"Proper length", to me anyway, has the same pedagogical risk as "rest mass". "Proper length" gives the impression that there's really only one frame where length can be measured and that length is poorly defined in other frames. That's not the case. It's semantics, I know, but it seems important somehow.

PD