# Re: Aberrations from the relativistic aberration of light

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*Source:* http://sci.tech−archive.net/Archive/sci.physics.relativity/2008−05/msg01450.html

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- *From*: Albertito <albertito1992@xxxxxxxxx>
- *Date*: Fri, 23 May 2008 13:11:37 −0700 (PDT)

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On May 23, 6:59 pm, shala...@xxxxxxxxx wrote:

> On May 23, 4:27 am, Albertito <albertito1...@xxxxxxxxx> wrote:
>
> > On May 22, 9:26 pm, shala...@xxxxxxxxx wrote:
> >
> > > On May 22, 2:24 pm, shala...@xxxxxxxxx wrote:
> > >
> > > > On May 22, 10:26 am, "Androcles"
> > > > <Headmas...@xxxxxxxxxxxxxxxx> wrote:
> > > >
> > > > > <shala...@xxxxxxxxx>
> > > > > wrote in message
> > > > >
> > > > > news:57c79e16−770f−48fc−b529−c5a83563bd40@xxxxxxxxxxxxxxxxxxxxx
> > > > > On May 21, 1:58 pm,
> > > > > "Androcles"
> > > > > <Headmas...@xxxxxxxxxxxxxxxx>
> > > > > wrote:
> > > > >
> > > > > > <shala...@xxxxxxxxx>
> > > > > > wrote in
> > > > > > message

news:74184524−b1b4−44ae−ab16−5dc0e2d951bd@xxxxxxxxxxxxx

|I always thought it worked like this:
|
| 1) The speed of light emitted by a source is c, regardless of its
| motion. That is, the photon does not move at a velocity of c with
| respect to some universal rest frame (how does one even begin to
| define such a frame anyway?).
|
| 2) Where an observer is moving at a relative velocity v \approx 0.5c
| directly away from the source, then a photon emitted directly toward
| the observer would approach it at relative velocity of

v \approx 0.5c,
| increasing the observed wavelength by 2 (half the speed of light,
| twice the absorption time, twice the wavelength, half the frequency).
| This is where the 1 − cos(\phi) v/c term comes from.

Nope. \phi is simply the angle of incidence. When the light (or sound) source is coming straight at you \phi is zero and cos(\phi) = 1.
If the light (or sound) source passes you by then \phi changes as it
does so. This is fairly obviously observed with the

change in shift of the sound of a passing car. The term is strictly Doppler's original.

| The remainder of
| the formula is just the kinematic time dilation of the observer.

No such animal exists.
http://www.androcles01.pwp.blueyonder.co.uk/Wave.xls
Feel free to check the equations or change the values in the yellow boxes.

|
| I take it you're not a fan of relativity.

You can take it I'm not a fan of

stupidity, I take it you are not a fan of reality.

--
Why did Einstein say the speed of light from A to B is c−v, the speed of light from B to A is c+v, the "time" each way is the same?

Androcles

http://www.androcles01.pwp.blueyonder.co.uk/

Androcles,

| Like I said in this example, where the observer is moving directly
| AWAY from the source, and the photon is moving directly TOWARD the
| observer, it's implied that their direction vectors are identical, and
| so phi = 0, cos(phi) = 1, and thus 1 − cos(\phi) v/c = 0.5, resulting
| in a doubling of the wavelength.

1− cos(0) = 1−1 = 0 when I
went to school. Maybe it has
changed
since then.

−−
Why did Einstein say
the speed of light from A to
B is c−v,
the speed of light from B to
A is c+v,
the "time" each way is the
same?

Androcles

http://www.androcles01.pwp.blueyonder.co.uk/

Androcles, you forgot to include v/c in your
calculation:

1 − cos(\phi) * v/c = 1 − 1 * 0.5 = 1 − 0.5 =
0.5

− Shawn

It also donned on me that this thread initially had nothing to
do with
the relativistic Doppler effect. In that case, my apologies
Albertito.

− Shawn

Don't worry, Shawn, Doppler effect, aberration of light
and addition of velocities are all related. This is the
simple equation that relates them all:

$$-c \ln(z+1) = v + w,$$

where,
v and w are velocities of source and observer
in a given frame of reference,
c is the velocity of light, and
z is the Doppler shift.

Notice that c is velocity of light, not a speed, so it is a vector.
The above formula is true because c depends on the velocity
of the source, it is not an invariant.

So, $|c \ln(z+1)|$ is the magnitude, norm, of the sum v + w.
This formula can't be found in any textbook. If you love
SR, then replace the binary operator + by Einstein addition
of velocities. This will make c be invariant in magnitude,
but not in direction wrt observer. If you love Galilean relativity
then retain + as strictly an euclidean vector addition.

Let's evaluate the above equation for some cases
where velocity of the source is v = 0. Then

$$-c \ln(z+1) = w$$

1) If $z = -1$, then $|c|$ = oo, which means the observer
approched the source at infinite speed.
2) if $z = e - 1$, then $c = -w$, which means the observer
is receding from the source at speed $|c|$.
3) if $z = 1/e - 1$, then $c = w$, which means the observer
is approaching the source at speed $|c|$.
4) if $z = 0$, then $w = 0$, which means the observer

> > is at rest wrt the source.
>
> > If you analyze experimental data, no Doppler blueshift z < 0 less than −1 will be found, as measured directly from the observed frequency f' and the original one f. Likewise, you will find out there can be Doppler redshifts, z >0, with no apparent upper bound. What does it mean?. It means the equation − c ln(z +1) = v + w is true, and SR is wrong.
>
> If you are talking about redshifts and z in regard to the apparent motion of receding galaxies, then yes, SR does not apply. This is not an effect of relative motion, but of the metric expansion of space. The photons are actually shifting in frequency/wavelength as they travel, unlike with the relativistic Doppler effect where the frequency/wavelength doesn't actually change. Is this what you're referring to?
>
> − Shawn

Well, I guess you mean the product frequency*wavelength doesn't actually change, under SR assumptions. No, I was referring to a more essential phenomenon. If you can find Doppler redshifts of frequencies larger than 1, why can't you find Doppler blueshifts of frequencies less than −1? It seems there is an asymmetry, doesn't it? SR can't deal with that asymmetry properly. There is something wrong in SR, and I think that something is its 2nd postulate.

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