

Re: Mass vs distance

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- *From:* Ian Macmillan <iandmac@xxxxxxxxxx>
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"paulaireilly" <paulaireilly@xxxxxxxxxx> wrote in message
news:1140417069.510072.92490@xx

Ian MacMillan wrote:

As I understand it, if a transmitter at the bottom of the hill in principle emits a series of pulses, a receiver at the top receives the same number of pulses, but at a lower rate over a longer period.

This is what general relativity predicts, and experiment confirms this prediction.

While I think I understand about the energy of a mass raised and lowered in a gravitational field....

I imagine that as a clock and a rod rise in a gravitational field, the clock runs faster and the rod gets longer so that the speed of light remains constant at every level. Is this a reasonable view?

I'm having trouble organising a response to the various issues here!

I can see that if individual photons lose energy on the way up, their sum total energy at the top will be lower. My problem is to understand how this relates to the presumably equivalent situation in the accelerating lift, where as far as I can see, the total energy is unchanged, especially if you think "waves"..

Incidentally, (possible red herring) I think the lift situation differs between where the lift acceleration is constant come what may, or whether it arises from a constant force.

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So it seems that rods and clocks vary with height so that the speed of light is the same locally at each height.

It also seems that the speed of light at the bottom of the hill is lower if observed from the top of the hill, because rods and times there are shorter if observed from above. Do I understand this correctly?

If a standard clock runs slower at the bottom as observed from above, standard frequencies generated there must also be lower. So this raises a doubt in my mind about whether the relative lower frequencies are from the source, or whether they arise from work done in raising the energy. For example, you can see the second hand turning slower through your telescope, where I think the information is independent of energy considerations.

But I still cannot connect the effects in the accelerating lift with those with the hill!

All the best
Ian Macmillan