

Re: Is $F=ma$ a definition or not?

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From: Franz Heymann (*notfranz.heyman_at_btopenworld.com*)

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"Mike" <eleatis@yahoo.gr> wrote in message
news:1105727092.906735.146040@z14g2000cwz.googlegroups.com...

>

> *Franz Heymann wrote:*

>

> [snip]

>>

>> *It sounds as if it is irrelevant to what has been discussed so far.*

>>

>

> *Maybe not.*

>

>>

>> *Newton's laws actually do not apply in the case of any planetary*

>> *orbits. It is only in the case of the elliptical orbits that the*

>> *deviation from Newtonian orbits can be observed.*

>

> *How so? $F = GMm(g)/r^2 = dp/dt = m(i)d^2r/dt^2$*

.

> *$m(g)$ = gravitational mass, $m(i)$ = inertial mass. Most of Eotvos based*

> *EP tests are based on this equation.*

The problem is not the equivalence principle. It is that according to GR, the Newtonian equation of motion is only an approximation to the truth.

> *Tjis equation hold to 1 part in 13*

> *trillion in the case of elliptical orbits near the surface of earth,*

> *which is exactly what a free-falling particle path is.*

The equation you quoted above predicts the precession of those planetary orbits with substantial ellipticity incorrectly. GR predicts it correctly.

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- > > *No, I can not. However, I do know that in the weak limit, GR and*
- > > *Newton make the same predictions.*
- >
- > *This contradicts what you said before.*

No

- > *The motion of the Moon around*
- > *the Earth is virtually weak limit.*

Nobody has yet found anything to worry about in connection with the orbit of the moon. Newton's equations make pretty accurate predictions for that.

The difference between Newtonian mechanics and GR shows up in a measurable way only in the case of planets with substantial ellipticity. The classical case is that of Mercury, in which Newton and GR predict different precession rates. GR turns out to be right. In later times, the precession of the orbits of one or two other planets have also been measured with sufficient accuracy to enable comparisons to be made between the predictions of Newtonian mechanics and GR. In all cases GR turns out to be right. I don't have the references to hand, so if you don't believe me, you will have to do your own legwork.

- >
- > > *You're just bragging now.*
- >
- > *Physics is bragging out?*

You have cunningly snipped your braggadocio, so I cannot comment any more about it. Tant pis.

- >
- > > *Remember: force is the only foundation of physics around,*
- > >
- > > *No.*
- >
- > *Yes, it is. Force is the only foundation of physics known today,*

No. Force does not enter any QED calculations, and QED has never predicted anything at variance with observation.

- > *ask*
- > *any physicist how knows what he's talking about.*

I am (was) a physicist.
I know what I am talking about.

- > *Have you heard of the*
- > *great effort to unite the four fundamental forces?*

Yes. I played a part in a substantial number of the experiments which provided data for the unification of the three which have so far been

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unified.

- > > > *No force, no motion, period.*
- > >
- > > *Bollocks. What happened to Newton's first law?*
- >
- > *Partly correct you are.*

No. Entirely correct.

- > *I should have said "change in motion".*

Well, be more careful about what you are saying in future, and remember that there are changes in motion possible without any net forces being applied to a body.

- > *Listen,*
- > *deviations from geodesic motion in GR is absolute motion. GRists*
hide
- > *their face in the sand. Space-time in GR is no less absolute than*
- > *Newton's absolute space. No progress has been made with GR towards a*
- > *relational dynamics. It's all the same religion as Newtonian*
- > *absolutism. Newton's last book was about the Bible, not physics. He*
- > *insisted that all motion is due to God and that his laws did not*
- > *explain anything. He was honest I say. False assurances small minded*
- > *brainwashed phycisists of all kinds offer these days to*
assymmetrically
- > *informed students who can only become victims of OTC stock brokers*
or a
- > *cheating wife from an ex eastern block country, in the best case,*
but
- > *never understand the foundational problems of physics.*

I will leave the pot pourri in your last paragraph for the delectation of other readers.

Franz