Re: Supersolidity and the breakdown of the General Relativity Equivalence Principle

Source: http://sci.tech−archive.net/Archive/sci.physics.relativity/2007−06/msg02553.html

- *From*: ny2292000 <quantuniverse@xxxxxxxxx>
- *Date*: Thu, 21 Jun 2007 05:40:04 −0700

On Jun 20, 12:55 pm, mathematician <hapor...@xxxxxxxxxx> wrote:

> On Jun 20, 2:32 pm, ny2292000 <quantunive...@xxxxxxxxx> wrote:
>
> > In my blog about the Hypergeometrical Universe, I posted a simple
> > solution to the supersolidity problem. This problem arises from an
> > experiment which has been interpreted along the lines of superfluidity
> > of solid Helium−4 phases.
>
> > Simple quantum mechanics argument showing that the core of the
> > rotating Helium−4 cell probes boths sides of motion and thus remains
> > effectivelly motionless below a critical temperature properly explains
> > the phenomena.
>
> > A quantum mechanical motionless states indicates a breakdown between
> > inertia mass and gravitational mass.
>
> Are you claiming that the local principle of equivalence (the weak
> form)
> is wrong or are you claiming that the global principle of equivalence
> is
> wrong (the srong form) ?
>
> Hannu

> Further considerations also show that inertia depends upon which
> motion you are considering. Although rotational motion inertial mass

(moment of inertia) goes to zero as temperature decreases,
translational mass (if one moves the whole He−4 cell) would not.

The site
ishttp://hypergeometricaluniverse.blogspot.com/2007/06/going−nowhere−fa...

Please feel free to contact me with questions or comments.

Thanks,

MP− Hide quoted text −

− Show quoted text −

Hannu,

Thanks for your question.

Weak Equivalence Principle:
The trajectory of a falling test body depends only on its initial position and velocity, and is independent of its composition.

Strong Equivalence Principle:
The gravitational motion of a small test body depends only on its initial position in spacetime and velocity, and not on its constitution.

I did not target any one of the principles, but a simple thought experiment where one has a supercolled He−4 celestial body would challenge the Weak form. I am proposing that the inertial properties of a body depends upon temperature and composition (bosonic or not).

What I am questioning is the one−to−one relationship between inertial mass and gravitational mass implicit in the equivalence principle, that is, 1 Kg of matter will always have one Kg of inertial mass. I am also emphasizing the link between moment of inertia and its counterparty inertial mass. The final result is that even though the weight of a sample in the He−4 supersolidity experiment doesn't change, its inertial mass to rotation can change.

This is totally different than conjuring up solid through solid flow

and explains the observed changes in the moment of inertia equally well.

Thanks,

MP

.