NOTE 7

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ABOUT GRAVITATION

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Introduction

In this note I only propose the following conjecture:
"Gravitational force is subject to an absolute upper limit which is the same in all Galilean frames."
I do not intend to give any mechanistic or relativistic model to defend this thesis, although it is the only usable result left of ideas I have had and which had convinced me to study theoretical physics more than fifty years ago. I will briefly analyze, in a non-mathematical way, what this claim implies.

Relation Between Inertial and Gravitational Mass

We nevertheless have to make some assumptions on the nature of inertial and gravitational mass. In the light of our hypothesis it seems logical to assume that the inertial mass of a composite body consisting of a very large number of inertial masses is in the end equal to a gravitational mass which is smaller than the sum of masses we started from. Nonetheless, it equally seems reasonable to assume that the achieved global inertial mass is also equal to the gravitational mass of the composite body. At any rate, it will appear so to the world, which is exterior to the composite body. All this remains in agreement with the assumption that such composite mass, if made growing, will asymptotically reach the upper limit along a curve which we consider to be a continuous function of the sum of the constituting smaller inertial masses. But, the addition of big masses should thus be non-linear.

Our claim says that the more inertial or gravitational (rest-)mass is accumulated, the less effective this becomes in absolute terms of total gravitational as well as resulting inertial mass. All mass measurements at the level of the solar system rely on this principle and to make it true, we partly absorb any difference in the gravitational constant at the terrestrial level and the resulting computed mass density at the solar system level.

Although we do not propose a formal model, the thoughts which have led to the conjecture, assume that the sum-defect of two big joined masses is, at the solar system level, something which implies that the result appears to a third attracted body as if the first two form a unity, thus typically what one calls an astronomical conjuction. This goes beyond the initial hypothesis, and could be called **the strong conjecture**. Theoretically claiming more, we, nevetheless, face a less probable standpoint.

What about general relativity? As explained, the mass equivalence principle fully applies as long as no heavy astronomical masses are collapsing or equivalently add together.

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Thereby, general relativity should apply in a very good approximation to our complete solar system, but not necessarily to all astrophysical phenomena.

Is Some Verification Conceivable?

Yes, probably! We herewith think at the slow increase of the Earth moon distance over the eons for which, hitherto, no really satisfactory explanation has been found.

The idea is that the moon does not experience the full gravitational pull of sun and and Earth together if the latter two act as if they were one body. In terms of the strong conjecture, defined before, this would happen during eclipses of the moon by the Earth. This casual and (probably extremely) minute gravitational attenuation experienced at these occasions would work like a tiny tangential acceleration (in the direction of motion) of the moon on its orbit, moving the moon orbit around the Earth up by a very small amount. Today's tracking and computational means are so accurate and sensitive that it is likely that they would be able to derive such orbital variations if not in a single occurrence, then in larger analyses of eclipse events.

Conclusion?

A conclusion is for beyond my time!!!