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The Easy Solution to the New Saturn Anomaly

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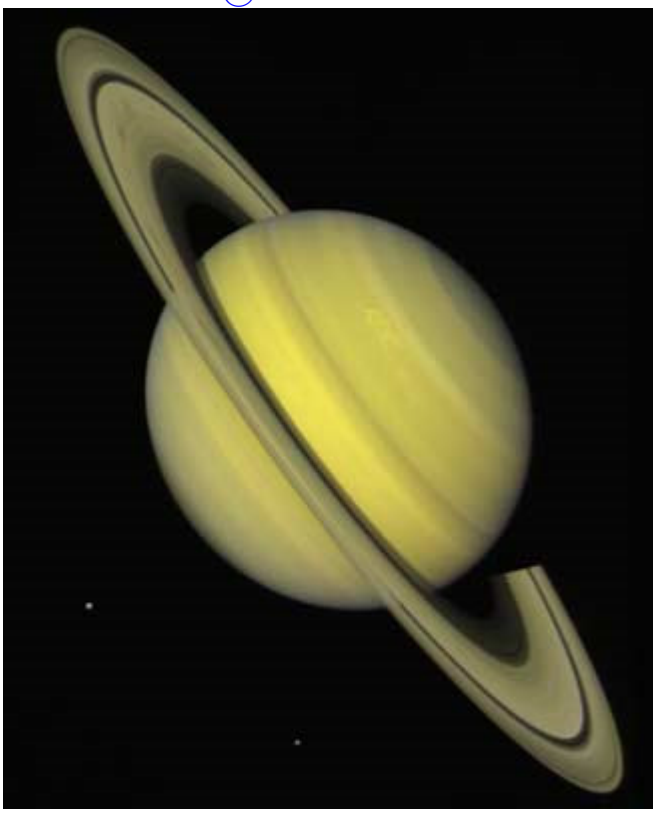

In November of 2008, Lorenzo Iorio published an announcement with ArXiv[1] that E.V. Pitjeva had analyzed Cassini spacecraft data, finding that the precession of Saturn did not conform to the predictions of GR. The gap between data and prediction was calculated to be .004-.008 arcsec/cy. The announcement in ArXiv corresponded to a paper by Iorio and Ruggiero in *SRX Physics*[2] at about the same time, in which the authors showed that theories of long range modified gravity (LRMG) could not explain the gap. This was in preparation for a paper by Iorio in July, 2009[3], which proposed that an undiscovered planet X was causing the gap.

This is a drôle repeat of history, since in 1859 Le Verrier proposed the planet Vulcan as the solution to the original precession problem with Mercury. But we need neither a new planet X nor any LRMG. The only "modification" we need to gravity is the simple one I have shown in my long paper on the precession of Mercury, http://milesmathis.com/merc.html. We don't need to "modify" gravity at all: we only need to correct the simple mistakes in the field equations we have. In fact, my finding that Einstein's field equations are 4% wrong in the field of the Sun is enough by itself to solve the Saturn anomaly. The accepted value for the precession of Saturn is .1836

arcsec/cy.[4] If we multiply that by .04, we obtain .007. That is nearly in the middle of the range calculated by Pitjeva, as you see. I solved the problem before I even knew of it. To put it another way, I *predicted* in 2007 that Einstein's field equations were 4% wrong. In 2008, that prediction was confirmed by data from Saturn.

I will repeat the short math I did in the other paper. Einstein's field equations are field equations of mass, as everyone should know. To solve, Einstein basically does a mass transform in a curved field. In other words, he takes his mass transform from SR and imports it into his tensor equations. The problem with this is that gravity is not a mass, it is a force caused by an acceleration field. Einstein needs to transform a force, but he only transforms a mass. Since by the classical force equation F = ma, force is measured in Newtons (kilogram meter per second squared), Einstein needs to transform mass, length, and time squared all in the same equation. I showed that in a given event, Mercury's mass would increase 1.57 times, while its length would increase by 1.04 and its time would decrease by 1.04. Since F = ma, our aggregate transform is just F = (1.57)(1.04)/$(1.04)^2$ = 1.51. The difference between 1.57 and 1.51 is 4%. Since Einstein is only transforming mass, his field equations must be 4% wrong across the board.

Critics will now say that my solution is just another LRMG, or a modified gravity, but it should be clear that it is not. One, because it is not an external modification to GR. It is simply a correction of an internal mistake. Two, because it is not an *ad hoc* addition to the field. I just showed you why my correction works, and none of the other LRMG's can do that. All the other "theories" are just gap fillers, created to answer specific shortcomings. My mathematical correction is a general solution, complete with all the mechanics. Nor does my solution fall to Iorio's *SRX Physics* paper, since my solution, although general, has to be applied to each known precession separately. My 4% correction applies to each problem, not to sets of problems. To be specific, Iorio and Ruggiero do the math for the perturbations between sets of planets, as in ΨJupSat = 1.36 ± .06. They find different values for different planet pairs, and conclude that LRMG's can't explain this variance. It is true that LRMG's can't explain this, but I can. Although perturbations cause precessions, calculating perturbations and calculating a change in precession on a single planet are two different things. In finding the number .04, you can see that I am calculating a general correction to the field. To apply that general correction to a specific perturbation between given planets requires more math. Specifically, it requires taking into account the two masses and the distance between them. Because the distances and masses are not equal, we should not expect the field errors or corrections to be equal. Iorio and Ruggiero's equations rule out the logarithmic correction and the power-law correction to gravity, but don't rule out my correction. In fact, their equations confirm my correction, since their tables 13 and 21 show that the variance in perturbations is a factor of distance and mass.

[1]http://arxiv.org/abs/0811.0756
[2]http://www.syrexe.com/physics/2008/968393.html
[3]http://arxiv.org/abs/0907.4514
[4]http://farside.ph.utexas.edu/teaching/336k/lectures/node128.html