Relativity Predicts a Variable G

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It is demonstrated that relativity predicts a variable G. The proof begins by considering a dimensionless particle in an empty universe. The analysis then extends to two particles, three particles, and an infinite set of particles. This approach enables the calculation of space-time structure for any realistic energy distribution. The proof employs the interchange of limits theorem and ad hoc sequences of energy distributions. With only one particle, the result is a singularity everywhere if the universe is empty outside the particle. These singularities completely disappear with three particles. The calculation is then generalized for any realistic energy distribution, naturally yielding an equation for G. This equation provides a correct approximation for most realistic energy distributions. The fundamental principles underlying Einstein's equation remain valid. However, it is shown that the anthropocentric solar system constant G must be replaced by a variable value, which is weaker in high matter density environments and stronger in low matter density environments. This was called a surrounding effect in previous works [1, 2]. This effect has been shown to resolve current gravitational mysteries in astrophysics and cosmology. Additionally, under a unifying relevant assumption, several puzzles in nuclear physics are either explained or solved, and a solution to the Yang-Mills Millennium problem is also provided.

References

[1] F. Lassiaille, *EPJ Web Conf.* **182** (2018) 03006.

[2] F. Lassiaille, *Nuclear Theory Proceedings*, Vol. 39, Heron Press, Sofia (2022) 185-194.