

Abstract Submitted
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Quantum-Mechanical Correction to the Speed of Light in a Gravitational Potential JAMES FRANSON, University of Maryland Baltimore County — We consider a model in which the gravitational potential energy of massive particles is included in the Hamiltonian of the Dirac equation. This results in a predicted correction to the speed of light that is proportional to the fine structure constant [1]. The correction to the speed of light obtained in this way depends on the gravitational potential and not the gravitational field, which is not gauge invariant and presumably nonphysical. Nevertheless, the predicted results are in reasonable agreement with experimental observations from Supernova 1987a, where the first neutrinos arrived 7.7 hours before the first photons.

[1] J.D. Franson, arXiv:1111.6986.

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