

Abstract Submitted  
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**New exact dynamic field solutions of Einstein's equation**

FRANKLIN FELBER, Starmark, Inc. — An exact metric first derived, but not analyzed, by Hartle, Thorne, and Price [1] is used to calculate the exact time-dependent gravitational field of a spherical mass moving with arbitrarily high constant velocity. The exact field solutions [2] confirm that even the weak field of a spherical mass moving faster than  $3^{-1/2}c$  is repulsive in the forward and backward directions [3]. The exact threshold conditions required for gravitational repulsion of particles at rest are determined as a function of source speed and field strength and particle position with respect to the relativistic source. The results are consistent with the repulsion of relativistic particles by a weak static Schwarzschild field, discovered 85 years ago by Hilbert [4].

[1] J. B. Hartle, K. S. Thorne, and R. H. Price in *Black Holes: The Membrane Paradigm*, edited by K. S. Thorne, R. H. Price, D. A. Macdonald (Yale U. Press, New Haven, Conn., 1986), Ch. V.

[2] F. S. Felber, arXiv:0803.2864v4 [physics.gen-ph] 2008.

[3] F. S. Felber, arXiv:gr-qc/0505098v2, 2005.

[4] D. Hilbert, *Math. Ann.* **92**, 1 (1924).

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