Abstract Submitted
for the APR11 Meeting of
The American Physical Society

New laboratory tests of relativistic gravity using dipole waves FRANKLIN FELBER, Starmark, Inc. — The most advanced gravity gradiometers and resonant transducers are now becoming capable of measuring dipole gravity waves produced by the most advanced periodic mass quadrupoles, like high-energy-density flywheels and teravolt-scale colliders. Laboratory tests of general relativity at relativistic speeds through measurements of dipole gravity waves in the source region are proposed.[1] A NASA G2 flywheel module with a modified rotor can produce a post-Newtonian dc bias signal at a gradiometer up to 1 mE. At peak luminosity, the repulsive dipole impulses of proton bunches at the LHC can produce an rms velocity of a high-Q transducer surface up to 4 μm/s at 31.6 MHz. The LHC test can be performed offline, without interfering with normal operations, and could provide the first evidence of repulsive gravity at relativistic speeds.

[1]F. Felber, http://arxiv.org/abs/1002.0351 (2010).

Franklin Felber
Starmark, Inc.

Date submitted: 14 Jan 2011 Electronic form version 1.4