

# The Gravitational Acceleration of Inertial Space

By Chuck Bennett

In 1907, Albert Einstein introduced the Equivalence Principle stating that a person on the surface of the earth feels gravitational force equivalent to being in an enclosed box in space accelerating at 1g [1]. Alternately, If the box were in freefall neglecting wind resistance, the person would feel weightless just the same as if the box were floating in space with no external forces acting on it.

Einstein ultimately concluded that space is curved in a gravitational field. In addition, the gravitational field influences the behavior of light. For example, experiments have been conducted finding that photons are red-shifted when traveling against gravity and are blue-shifted when traveling with gravitational acceleration [2].

In an alternate point of view, gravity is redefined as accelerating inertial space. An inertial reference frame is that reference frame upon which there are no forces acting.

Objects in freefall are in an inertial reference frame; whereas, fixed at the surface of the earth is not inertial space. Compressive forces exist on an object that is fixed at the surface of the earth because inertial space is collapsing with an acceleration of 1g.

In freefall, inertial space does not have an actual relative velocity of the associated light-carrying medium. Michelson and Morley failed to detect such medium [3]. We can only conclude that inertial space is accelerating inward towards the center of the earth.

## References

[1] Einstein, A. "On the Relativity Principle and the Conclusions Drawn from it," Jahrbuch der Radioaktivität und Elektronik 4 (1907): 411-462

[2] Pound, R. V.; Rebka Jr. G. A. "Gravitational Red-Shift in Nuclear Resonance". Physical Review Letters. (1959) 3 (9): 439–441.

[3] Michelson, Albert A.; Morley, Edward W. (1887). "On the Relative Motion of the Earth and the Luminiferous Ether." American Journal of Science. 34: 333–345.