

Hand paper
but nothing new

A Proposed Experiment for the Investigation of Antigravity

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Abstract

The need for an experimental basis for further progress in our knowledge of gravitational phenomena is discussed. It is proposed to investigate whether gravitational repulsion between matter and antimatter (antigravitation) exists. The experiment envisaged uses a source of electrons and positrons which, by magnetic analysis and a focusing system provides a pair starting from a small region with small velocity components along earth's field. In a homogeneous magnetic field, serving as a trap, the particles spiral toward electron and positron scintillation detectors. Possible differences in flight time, such as would arise from antigravitation, would be measured by delayed coincidence techniques.

The entire course of all physical phenomena known to man is to be ex-
 plained in terms of the action of the four known types of forces. These are
 in order of increasing intrinsic strength: the gravitational forces, the
 "weak" couplings responsible for the decay of some elementary particles,
 the electromagnetic forces, which play a dominant role in modern technology
 and which govern all chemical and, therefore, biological processes and finally,
 the nuclear forces which, of course, are ultimately responsible for the con-
 sistance of atoms and the existence of stable matter. Of these it is known
 to everyone that the gravitational forces were the first to be observed and
 recognized. Long before the existence of the other stronger forces was
 revealed gravitational phenomena played a dominant role in everyday life.
 It is therefore ironical that we know far less about these interactions than
 any of the others.

This is at least in part due to the extremely weak nature of the
 gravitational coupling. So far, the only laboratory in which relevant
 observations could be made in the solar system and, to some extent, portions
 of the rest of the universe. In this laboratory the physical parameters are
 not easily controlled. Even so, those few effects which are designed to
 test the existing theories of gravitation are so small as to provide incon-
 clusive evidence. It is recognized that the more rapid advance made in
 other fields arises from the fortunate circumstances that controllable ex-
 periments are possible and comparatively easy.

Under these circumstances I. Introduction