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Quantized Gravitation of Electromagnetic Waves as a Possible Solution to the Pioneer Anomaly PHILMORE RUSSELL, North Carolina Central University — Analysis of radiometric data from the Pioneer 10 and 11 probes indicate that they are begin slowed by an anomalous constant acceleration with an average magnitude $a_P \sim 8 \times 10^{-8} cm/s^2$ oriented with respect to the sun. We propose that the nature of the acceleration is due to a curvature of the space-time continuum caused by the suns light, which is predicted by G.R. We describe the acceleration as a quantized effect that depends on the frequency of the light and not the intensity, a kind of photo-gravity effect analogous to the photoelectric effect. The acceleration can be described by the equation:

$$a = [h]\nu c$$

The constant used is equal to Planck's constant and is placed in brackets to indicate it is dimensionless:

$$[h] = 6.626068 \times 10^{-34}$$

Although we associate the acceleration with the photons emitted by the Sun, we attribute the actual anomalous acceleration to gravitons associated with these photons. Any change in an emitted photon's energy is accompanied by a change in the energy of its associated graviton. We attribute the observable (acceleration) to the energy of the graviton. A photon's graviton's energy changes independently of its own, so we treat it as a separate variable, in the same manner that charge, spin and mass may be separate characteristics of the same particle. Separating the magnitude of the acceleration from the energy of its photon effectively shows why the anomalous acceleration is not seen in the planets. The planets, through their gravity fields, attenuate the acceleration associated with the photons by changing their energy through gravitational red-shift. Photons approaching the planets experience an increase in energy, but a decrease in graviton energy, or acceleration. Subsequently, planets alter the degree of perturbation to their trajectories by the acceleration. As the mass of the planets are much larger than the mass of the probes, they are able to effectively mask the anomalous acceleration detected in the Pioneers.

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