Sagnac Dual-Polarized Ring Laser Interferometric Effects of Gravity on EM-Wave Polarization

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The utility of Sagnac Effect 4-mode dual-photon propagation ring laser apparatus for measuring the effects of gravitational interactions on the polarization of an EM-wave is described. The device is designed to study the nature/detection of gravitational waves in terms of Extended Electromagnetic Theory, where the postulated longitudinal $B^{(3)}$ EM-field supports a photon mass anisotropy framework for G-wave detection. The 4 different beams have 4 different phase velocities, dependent upon polarization and propagation direction. Motivation was acquired serendipitously by noticing a disparity in wavepacket dispersion/attenuation for seasonal patterns and periods of no service and intermittent (dropped) service in the region near the operational cutoff limit of 900 or 1800 MHz telecommunication EM-wave signals, where signal strength attenuates periodically by factors attributed to coupled oscillation between the solar field dynamo (physical process generating Sun's magnetic field) and the Earth's geomagnetic core dynamo - in conjunction with seasonal tilt of the Earth's axis and gravitational changes during sunrise/sunset periods. Since there are no known thermodynamic effects on the propagation of EM-waves, we are left to postulate G – EM interaction effects. Experiments conducted by R.M. Kiehn using dual polarized ring lasers verified that the speed of light can have these 4 different phase velocities depending upon direction and polarization; the 4-fold Lorentz degeneracy can be broken with parity and time-reversal symmetry breaking. In contrast to large-scale LIGO interferometers (current - L-shaped 4 km arms with 3,000 km separation, proposed - 40 km triangular arm configuration) for detecting cosmic gravitational waves; our apparatus is tabletop and designed to measure gravitational effects on photon polarization. Current thinking in Geometrodynamics assumes gravitational waves travel at the speed of light, where distance for LIGO interferometry corresponds to a difference in G-wave arrival times of up to ten milliseconds. Our model requiring additional theory, suggests that neither classical EM-theory nor quantum field theory provide a sufficient framework for describing these EM – G-wave polarization interactions; which for us requires a modified M-Theoretic topological approach integrating Newtonian instantaneity with Einsteinian relativity as described by a unified field mechanical Ontological-Phase Topological Field Theory.

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