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Exotic Rotational Correlations in Emergent Quantum Geometry

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It is proposed that small amplitude, coherent rotational fluctuations arise from the emergence of nearly-classical non-rotating inertial frames from Planck scale quantum elements. An exact form is calculated for Planck scale correlations in the signal of a Sagnac type interferometer, where the light path encloses a large area of arbitrary shape, normalized using area quantization from Loop Quantum Gravity.

It is conjectured that such Planck scale rotational fluctuations, entangled with the strong interaction vacuum, may determine the value of the cosmological constant. Cosmic acceleration may be viewed as centrifugal acceleration by rotational fluctuations of the matter vacuum.

An experiment concept is sketched, based on a reconfiguration of the Fermilab Holometer.

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