Abstract Submitted
for the APR18 Meeting of
The American Physical Society

Phenomenology of Holometer Cross-Correlations in Relational Emergent Space-Time[1] OHKYUNG KWON, Korea Adv Inst of Sci Tech , CRAIG HOGAN, Fermilab and University of Chicago, HOLOMETER COLLABORATION — A Lorentz invariant framework is presented of exotic cross-correlations in the signals of two separate Michelson interferometers with bent arms, associated with the emergence of space-time and inertial frames from a Planck scale quantum system. Space-time relationships are modeled as antisymmetric cross-covariances on past and future light cones between world lines of Planck bandwidth in proper time, arising from nonlocal entanglement in geometrical states. Causal diamonds in a flat space-time are normalized to have the same holographic information content as black hole event horizons. The phenomenology produces a unique signature: a mostly imaginary broad-band cross-spectrum that is acausal in standard physics, with a frequency response derived from the layout and causal structure of the physical system. The framework will be used to interpret data from the reconfigured Fermilab Holometer and guide conceptual design of future experiments.

[1]U.S. Department of Energy at Fermilab, Contract No. DE-AC02-07CH11359 / National Research Foundation of Korea, Grant No. NRF-2016R1D1A1B03934333

Ohkyung Kwon
Korea Adv Inst of Sci
Tech

Date submitted: 06 Jan 2018 Electronic form version 1.4