Comment pertaining to "*Observation of the dynamical Casimir effect in a superconducting circuit"*, Nature 10:1038 v 479

The recent measurements of the Casimir effect by Wilson, et al[1] established the existence of a pervasive background of charged particles in what has been perceived as an empty Universe. As a result, photons moving through what we have hitherto taken as a vacuum will be slowed[5], while neutrino speed will be unaffected. All our measurements of the propagation of light and its wavelength have not been been corrected for this slowing.

Wilson's result means the very idea of a vacuum is revealed as an unattainable limit. Now we must regard c as a value that is the limit of velocity in our Universe in its role as a dimensional coefficient in the Minkowski metric, similar to absolute zero in the temperature domain. The SI system has referred to it as c_0 and so shall we.

We would like to point out the Casimir effect has a significant consequence on the recent controversies regarding the measurements of neutrino[4] velocities at CERN/OPERA[2]. Their result, $(v\text{-}c)/c = (2.37 \pm 0.32\ (\text{stat.})(\text{sys.})) \times 10^{-5}$, could easily be less than the reference speed of light c_0 rather then the measured speed of light or c_m (299,792.4562±0.0011 km/sec[3]) once c_0 is adjusted for refractive effects.

We propose that the maximum speed c_0 is greater than that measured in the OPERA result. If we are correct relativistic limits still hold and the space/time index of refraction is slightly greater then 1.

Until the refractive effects of the background particles are either measured or calculated, we really do not know whether the neutrinos are in fact violating relativistic limits. To the latter end, we will soon propose some experiments which might accomplish such measurements.

Vic Kley and John Celenza
Berkeley, CA
12/23/11

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[1] Wilson *et al.* Observation of the dynamical Casimir effect in a superconducting circuit. Nature 10:1038 v 479 (2011)

[2] Adam *et al.* Measurement of the neutrino velocity with the OPERA detector in the CNGS beam. arXiv:1109.4897 (2011)

[3] Evenson, KM *et al.* Speed of Light from Direct Frequency and Wavelength Measurements of the Methane-Stabilized Laser. Physical Review Letters **29** (19): 1346–49 (1972)

[4] Aoki, S *et al*. Measurement of low-energy neutrino cross-sections with the PEANUT experiment. New J. Phys. **12** (2010) 113028

[5] V.I. Berezhiani and S.M. Mahajan. "Heavy Light Bullets" in Electron-Positron Plasma Institute for Fusion Studies, University of Texas at Austin. IFSR 696 (1995)