Abstract Submitted
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Cosmological Photons ROBERT DRISCOLL[1], Institute for Basic Research — Assumed: photon has electric dipole moment P (Ref. 1) normal to its spin, rotating at photon frequency f, radiating classically. Then: $hdf/dt = cdf/dx = -[4(\pi^3)/3]\ (\mu/hc)\ [(f^2P)^2]$; c: standard light speed; x: photon distance from source; μ: vacuum magnetic permeability; h: Planck's constant. Earlier shown (Ref. 2) from Hubble's data: $(P'^2)(f'^3) = 8.8E(-39)$ S.I.; f': photon emission frequency; P': P at emission. Observations of type Ia supernovae and the present study (Refs. 3,4): there must be a relation between P and f; simplest is $P^2 = Q(f^n)$. Q: fitting constant; n: any real number. Comparison of normalized luminosity distances and theoretical coordinate distances gives n = -1.53, with standard deviation 0.013. Speculation: finite graviton half-life T limits general relativistic relations to a sphere of radius cT/2; the universe is infinite and nonexpanding.

1. N. Fortson, P Sandars and S. Barr, *Physics Today* 56, 33 (June 2003).
2. R. B. Driscoll, *Physics Essays* (in press).
3. A. G. Riess *et al., Astrophysics Journal 687*, 665 (2004). 4. R. B. Driscoll, *Physics Essays* (under review).

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