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Derivation of cosmic acceleration and the cosmological constant in the local universe THOMAS CHAMBERLAIN, UC Berkeley (Ph.D., ME) — Observed type Ia supernovae reveal accelerating Hubble expansion indicating an energy fluid fills space or that the excellence of general relativity on the Solar scale is not matched on the cosmic scale. The latter alternative could mean that a deeper understanding of space-time physics is appropriate for solving "dark energy" and related problems (e.g., tension in the Hubble parameter measurements). Here the cosmological constant in general relativity has been recalled as germane to cosmic acceleration, however a satisfactory relativistic explanation has not been given. We consider that postulated inward-infinite light-speed along lookback time and distance (replacing Einstein's isotropic light-speed as *empirically* equivalent) yields an empirically consequential outward cosmic time dilation which, when "rotated" into epochal space and inserted into the Lorentz transformation, gives a linearly increasing cosmic acceleration consistent with Hubble's law. This *leading order* result—in agreement with supernova type Ia magnitude data in the local universe ($z < 0.3$) and the empirical facts in general—adds to previous knowledge by giving relativistic relationships for cosmic acceleration and the corresponding cosmological constant. Follow-on investigation accounting for lookback time and distance is anticipated of "too fast" cosmic-structure dynamics (e.g., of wide binary stars, spiral galaxies, and galaxy clusters).

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