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## Early Dark Energy & the Hubble Tension

We explore a scenario with a new exotic energy density that behaves like a cosmological constant at early times and then decays quickly at some critical redshift  $z_c$ . This work was motivated by tensions between the value of the Hubble constant  $H_0$  determined from the CMB and that measured in the local universe. By increasing the expansion rate at early times, the very precisely determined angular scale of the sound horizon at decoupling can be preserved with larger  $H_0$ . We find, however, that the Planck temperature power spectrum tightly constrains the magnitude of the early dark-energy density and thus any shift in  $H_0$  obtained from the CMB. In the process, we derive strong constraints to the contribution of early dark energy at the time of recombination - it can never exceed  $\sim 2\%$  of the radiation/matter density for  $10 \leq z_c \leq 10^5$ .

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