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## Evidence for strong progenitor age bias in supernova cosmology

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Supernova (SN) cosmology is based on the assumption that the width-luminosity relation (WLR) and the color-luminosity relation (CLR) in the type Ia SN luminosity standardization would not show luminosity offsets with progenitor age. Unlike this expectation, recent age datings of stellar populations in host galaxies have shown significant correlations between progenitor age and Hubble residual (HR). Here we show that this correlation originates from a strong progenitor age dependence of the zero-points of the WLR & CLR, in the sense that SNe from younger progenitors are fainter each at given light-curve parameters  $x_1$  and  $c$ . This 4.6 sigma result is reminiscent of Baade's discovery of the zero-point variation of the Cepheid period-luminosity relation with population age, and, as such, causes a serious systematic bias with redshift in SN cosmology. Other host properties show substantially smaller and insignificant offsets in the WLR & CLR for the same dataset, indicating that progenitor age is the root cause of the reported correlations between host properties and HR.

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