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A new measurement of the Hubble constant using Type Ia supernovae calibrated with surface brightness fluctuations

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We present a new measurement of the Hubble constant (H_0) using supernovae type Ia (SNe Ia) based on the Surface Brightness Fluctuations (SBF) distance measurement method. We build a sample of calibrating anchors consisting of 24 SNe hosted in galaxies having SBF distance measurements. Applying a hierarchical Bayesian approach, we calibrate the SNe peak luminosity and extend it into the Hubble flow by using a sample of 96 SNe Ia in the redshift range $0.02 < z < 0.075$. Our estimated H_0 value sits midway in the range defined by the current Hubble tension. We find that the SNe Ia distance moduli calibrated with SBF are on average larger by 0.07 mag than the ones calibrated with Cepheids. Our results point to possible differences among SNe hosted in different types of galaxies, which could originate from different local environments and/or SNe Ia progenitor properties. Sampling different host galaxy type, SBF offers a complementary approach to Cepheids which is important in addressing possible systematics and providing an alternate path to the measurement of the Hubble constant in the local universe.

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