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Strategies for precise and accurate measurements of the Hubble constant with strong lensing

Strong lensing time delays can measure the Hubble constant H0 independent of any other probe. Assuming commonly used forms for the radial mass density profile of the lenses, a 2% precision has been achieved with 7 Time-Delay Cosmography (TDCOSMO) lenses, in tension with the H0 from the cosmic microwave background. However, without assumptions on the radial mass density profile – and relying exclusively on stellar kinematics to break the mass-sheet degeneracy – the precision drops to 8% with the current data of the 7 TDCOSMO lenses, insufficient to resolve the H0 tension. With the addition of external information from 33 Sloan Lens ACS (SLACS) lenses, the precision improves to 5%.
I highlight the assumptions that went into the recent measurements and present strategies to improve the precision of time-delay cosmography without relying on mass profile assumptions to break the mass sheet degeneracy.

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