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Constraints on the free-streaming length of dark matter and halo concentrations with quadruple-image strong gravitational lenses

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The particle nature of dark matter determines the abundance and density profiles of dark matter halos. On sub-galactic mass scales differences between various dark matter models become especially pronounced. Strong gravitational lensing by galaxies offers a direct probe of dark matter structure in this low-mass regime where halos contain little to no stars, and are therefore invisible. I will describe how dark matter structure affects the observables in strong lens systems, and recent constraints on the free-streaming length of dark matter and the mass of a thermal relic dark matter particle from a joint analysis of eight quadruply-imaged quasars.

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