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Detecting low mass haloes with lensed arcs: predictions

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Strong gravitational lensing is one of the most accurate methods to measure the mass of galaxies and haloes and one of the most promising to investigate the nature of dark matter. It allows us to probe one of the key signatures of warm dark matter models: the lack of small-mass dark clumps with respect to CDM. Low-mass haloes and subhaloes can be detected through their effect on the surface brightness distribution of lensed arcs, but the number of detections that have been claimed so far remains low.
I will present the results of a systematic comparison between mock and real observations with theoretical predictions, with the aim of establishing the sensitivity limits of instruments such as HST, Keck, ALMA, Euclid and JWST and thus determine which instruments and which sample of lenses is the most promising, together with the observational and modelling challenges that will be faced. I will discuss which kind of observations will give the community the best chance of detecting low-mass dark haloes and subhaloes and present forecasts on the sample size that would be needed to confirm or exclude CDM at a significant level.

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