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Investigating dark matter properties with flux-ratio anomalies in radio-loud strongly lensed quasars

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Flux-ratio anomalies in strongly lensed quasars provide a promising approach to probe dark substructure abundance in distant galaxies. Two decades after the first major analysis, more lenses with significantly better data quality are available with modern interferometry such as VLBI. A matching improvement in the analysis process is therefore needed in order to investigate detailed dark matter properties. Recent studies have shown that, besides dark substructure there are two additional components that can cause flux ratio anomalies:
baryonic structures in lens galaxies and line-of-sight objects.
These two factors are not taken into account in most of the previous analyses of flux-ratios in lensed quasar systems.
I will present our results from a joint analysis on the latest data from radio and mid-infrared flux measurements. Importantly, we consider both baryonic disk and line-of-sight signals in our analysis process. Our results demonstrate a new analysis strategy for upcoming large samples from SKA, JWST and future surveys.