QUASAR STRUCTURE USING MICROLENSING

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ABSTRACT. Structure of the AGN emitting region has been limited due to the small angular sizes of accretion disks. Multiply images quasars offer the opportunity to resolve the accretion disk structure using microlensing of the disk by the stars in the lens galaxy. We derive the size and temperature profile of the accretion disk of the lensed quasars by measuring the wavelength dependence (chromaticity) of the microlensing magnification produced by the stars in their lens galaxies. Simulations indicate that one of the images is strongly microlensed. If we model the change in disk size with wavelength using a Gaussian source ($I \propto \exp(-R^2/2rs^2)$) with a disk size scaling with wavelength asrs $\propto \lambda^p$ and using uniform and logaritmic priors we can estimate rs and p. The disk temperature profile $T \propto R^{-1/p}$ is consistent with thin disk theory ($T \propto R^{-3/4}$), given the uncertainties. The estimates of rs are also in agreement with the size inferred from thin disk theory using the estimated black hole mass ($MBH \simeq 2 \times 10^9 M\odot$) but not with the smaller size estimated from thin disk theory and the optical flux. Are there any methods to improve these estimations?

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