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NEW QUASAR MICROLENSING CONSTRAINTS ON THE SPIN OF HIGH REDSHIFT QUASARS

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Gravitational microlensing provides a unique probe to study the emission region of the innermost parts of quasar accretion disks and the discrete lens popolution in the lensing galaxy. We present new quasar microlensing constraints on the spin of high redshift quasars from a joint analysis of the excess equivalent widths of the FeK line observed in the lensed quasars. We first confirm the positive offset from the Iwasawa-Taniguchi effect for lensed quasars, and then performed microlensing analysis to constrain the emission size of the reflection region and the average spin of supermassive black holes, assuming that the X-ray corona and the reflection region, responsible for the iron emission line, both follow power-law emissivity profiles. The microlensing analysis yields a steep emissivity index and a large spin parameter, suggesting that the X-ray reflection region is ultra-compact and very close to the innermost stable circular orbits of black holes, which are spinning close the maximal value. The analysis represents a new technique to measure black hole spins for high redshift quasars.