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The estimation of black-hole masses in distant radio galaxies

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Abstract

We have estimated the masses of the central supermassive black holes of 2442 radio galaxies from a catalog. Mass estimates based on optical photometry and radio data are compared. Relationships between the mass of the central black hole M_{bh} and the redshift z_p are constructed for both wavelength ranges (radio and optic). Upper-envelope cubic regression fits are obtained using the maximum estimates of the black-hole masses. The optical and radio upper envelopes show similar behavior, and have very similar peaks in position, $z_p \approx 1.9$ and amplitude, $\log M_{bh} = 9.4$. This is consistent with a model in which the growth of the supermassive black holes is self-regulating, with this redshift corresponding to the epoch when the accretion-ow phase begins to end and the nuclear activity falls off.
