

Bolometric Luminosity Estimation from Multi-band Data in SDSS Quasars

Monday 18 November 2024 11:20 (20 minutes)

Bolometric luminosity is a fundamental property that enables us to resolve the central supermassive black hole (SMBH) accretion history. A common method to quantify bolometric luminosity is based on only one monochromatic luminosity. To take advantage of multi-band data, we explore the mid-infrared through ultraviolet spectral energy distributions of $\sim 30,000$ SDSS broad-lined quasars with $0.5 < z < 2$. We present a method to calculate bolometric luminosity by matching a few photometric observations in large quasar samples. We show that this method can reduce the systematic error of the bolometric luminosity, and will be useful for calculating the bolometric quasar luminosity function accurately. In addition, we provide the multi-linear regression between bolometric luminosity and monochromatic luminosities for 1450, 3000, and 5100 Angstrom. Our bolometric luminosity measurement can be applied to the quasar population across a wide range of luminosity and redshift.

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