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A Study of the Continuum Emission Spectrum from the Central Engine in Narrow-line Seyfert Galaxies

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Accretion disks around black holes are considered to be the physical source of high-energy emissions in objects such as quasars and active galactic nuclei. Some famous models, such as α-model, slim model and ADAF model, are often employed to explain various observational phenomena under different conditions, and they have achieved significant success. However, these models do not describe how outflows are produced during super-Eddington accretion, and most recent studies have not considered the structural differences in the accretion disk along the vertical direction. A supercritical accretion disk model, proposed by (Cao & Gu 2022), suggests that when the accretion rate is high, the radiation intensity may exceed the gravitational confinement, driving matter to leave the accretion disk and form outflows. In this study, we investigate multi-wavelength continuum emission spectra data from the central engines of several narrow-line Seyfert galaxies, where the radiation exceeds the Eddington luminosity. We employ an empirical formula introduced by (Chiang 2002) for the frequency correction of the blackbody spectrum, considering the thermal emission from the corona. By fitting the observed data using this formula, we obtain good fitting results and constrain important physical parameters of these systems. Our findings indicate a certain level of credibility for the accretion disk model with radiation-driven outflows.

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