

VARIABILITY IN SUPER MASSIVE BLACK HOLE BINARIES

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Super massive black hole binaries (SMBHB) at subpc scale cannot be spatially resolved, therefore, spectroscopic observations of SMBHB candidates is a way to detect such systems. Here we present a study about possibility to detect SMBHB systems using spectral observations in the optical spectral band (around $H\beta$ line). We made a SMBHB model where both components have accretion disks and broad line regions (BLRs) inside the Roche lobes which followed central black hole motion. Additionally, we assume that the system is surrounded with circum binary region which also can emit broad lines.

We explore spectral variability in $H\beta$ line and continuum at $\lambda = 5100\text{\AA}$ for SMBHB taking different parameters of binary systems. We show that most of line variation coming from orbital dynamics of the black holes, and that continuum variability is present only in cases when components have higher masses ($\sim 10^8$). The emitted flux from SMBHB is periodical, but the periodicity can be clearly seen in the case of high signal-to-noise (S/N) ratio.