XI SERBIAN CONFERENCE ON SPECTRAL LINE SHAPES IN ASTROPHYSICS
August 21-25, 2017, Šabac, Serbia
Book of Abstracts, Eds. L. Č. Popović, A. Kovačević and S. Simić
Astronomical Observatory Belgrade, 2017

Invited Lecture

SUPER-EDDINGTON ACCRETING MASSIVE BLACK HOLES IN ACTIVE GALACTIC NUCLEI

J.-M. Wang

Institute of High Energy Physics, Chinese Academy of Sciences, Beijing 100049, China

E-mail: wangjm@ihep.ac.cn

Reverberation mapping of active galactic nuclei (AGNs) provides reliable technique to measure the central black hole mass. An empirical relation between the broad-line region size and optical luminosity, known as $R-L$ relation, has been set up by great efforts over more three decade since 1980s. Nowadays, the $R-L$ relation has been popularly applied to estimations of black hole mass in large samples of AGNs and quasars. A large undergoing campaign of spectroscopically monitoring active galactic nuclei with super-Eddington accretion rates have performed about 30 targets since 2012. We show among these AGNs: 1) Hβ lags are much shorter than the expected by the $R-L$ relation strongly depending on accretion rates; 2) optical Fe II emissions have clear reverberation to the varying continuum and lags rely on flux ratio of Fe II to Hβ; 3) the presence of saturated luminosities agreeing with the classical model of slim accretion disks, namely the radiate luminosities are only sensitive to the black hole mass; 4) super-Eddington accreting massive black holes are expected as a new kind of candles to measure cosmological distance of high-z Universe beyond the scope of type Ia SN; 5) the current black hole mass is underestimated by the $R-L$ relation in about 1/3 AGNs and quasars. Besides these findings, I will report all new results of the campaign of observations since 2015.