Global parameters of Quasars with anomalous electromagnetic spectrum.

Marcin Marculewicz

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The thesis concerns the analysis of the Active Galactic Nuclei. These are galaxies with an active core. The most luminous type of Active Galactic Nuclei is Quasar. It contains the supermassive black hole at the center. One of the least known subtypes of Quasars are: *Weak emission-Line Quasars (WLQs)*. Their recognizable feature is weak emission lines. The thesis consists of two projects: *Study of Quasars with weak emission-lines* and *Investigation of SDSS J110511.15+530806.5 deep absorption*.

The primary goal of PhD thesis is to evaluate **the global parameters** such as: the black hole mass, the accretion rate, the spin of the black hole, and the inclination of weak emission-line quasars based on *the continuum fit method*. This method apart from the literature black hole masses estimation methods **does not depend** on the observed Full Width at Half Maximum (FWHM) of the emission line, which could be biased due to the weakness or lack of the emission lines in these quasars. Using the Spectral Energy Distribution (SED) of quasars, I have fitted the geometrically thin and optically thick accretion disk model described by Novikov & Thorne equations. I have obtained the model of the continuum of the accretion disk for the 10 weak emission-line quasars. The SMBH masses of those objects were estimated previously based on the single-epoch virial method. Generally, the reverberation mapping method and the single-epoch virial black hole (BH) mass method are inadequate for BH mass estimation in WLQs, due to the weakness of emission lines in these objects. I have created a grid of accretion disk models using the Novikov–Thorne formulas. The phenomena of the WLQs were expressed by global parameters to describe the observed SED. Using the pure Novikov–Thorne model I could describe the SED of WLQs very well. I have compared obtained BH masses with those obtained from the literature. The SMBH masses of WLQs, which are estimated based on $FWHM(H_\beta)$, are underestimated. I have proposed the new formula to estimate black hole mass in WLQs based on their observed $FWHM(H_\beta)$. This equation helps to calculate the proper weight of BH masses.

The second project concerned the description of abnormal, deep absorption of SDSS J110511.15+530806.5 quasar. Initially, the abnormal absorption of SDSS J110511.15+530806.5 quasar was attempted to be explained by different absorption models which occur in Milky Way. However, none of them were enough to explain such deep absorption. I checked the correctness of the thesis posed that corona and warm skin concept above/around an accretion disk explain this phenomenon. In further analysis, I have constrained the extended model using the Xspec package and models within. I have described the modeling and the results of the fitting of the corona and the warm skin of SDSS J110511.15+530806.5. The final form of the model contains extinction of our Galaxy and global absorption describes by the accretion disk model with warm skin and a corona influence. I have postulated the explanation of the origin of the absorption in SDSS J110511.15+530806.5 by strong outflow/wind and/or intervening material along the line of sight.