

A NEW APPROACH TO MEASURING THE SIZE OF THE DUST SUBLIMATION REGION IN AGNS

V. AFANASIEV¹, E. SHABLOVINSKAYA¹

¹ *Special Astrophysical Observatory of the Russian Academy of Science,
Nizhnii Arkhyz, 369167, Russia*

E-mail: vafan@sao.ru

Here we give an observational method for measurements of the equatorial scattering region radius using variability in the polarized broad lines in Type 1 active galactic nuclei (AGNs). The polarization in broad lines of Type 1 AGNs is mostly caused by equatorial scattering which specific features allow one to separate its contribution from the total polarized flux. We propose to monitor variability in the polarized line flux and finding the time lag between the non-polarized continuum and polarized broad line variability, then the distance to the scattering screen can be determined from the time delay.

The method was, for the first time, applied to the observations of Type 1 AGN Mrk 6, and we found that the size of the scattering region in this AGN is around 100 light days. That is significantly smaller than the dusty region size estimated by the infrared interferometric observations and also larger than known broad line region (BLR) size. This indicates that the scattering region lies between the BLR and the dusty region and could be used as a probing of the dust sublimation radius. Supported by the Russian Science Foundation: project no. 20-12-00030.

References

Shablovinskaya, E., Afanasiev, V., Popović, L.: 2020, *ApJ*, in print.