THE STUDY OF A MAGNETIC FIELD STRUCTURE IN BLAZAR JETS BY OPTICAL PHOTOPOLARIMETRIC DATA

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There are no direct methods to measure magnetic field intensity in sources of synchrotron radiation. Usually estimations of magnetic field intensity are obtained from the Faraday rotation measure in radio region with additional data about a path length and an electron density. Besides the Faraday rotation of polarization plane there are observational parameters which are connected directly with the intensity of magnetic field and its structure: a polarization degree and a spectral index. Both these parameters can be obtained from optical observations. On the other hand, various theoretical models connect magnetic field intensity with polarization degree.

From two polarimetric modes observed in blazars: circular and linear, the last one is rather large (from 1% to 40%) and can be detected easily in contrast to the circular polarization which is very small (fraction of percentage). In its turn, the linear polarization is directly connected with spectral index. So, the comparison of theoretical predictions from various models of magnetic field with observed dependencies between polarization degrees and spectral indices allows to significantly confine an uncertainty of the magnetic field intensity estimations. The first such attempt had been made about 30 years ago by Nordsieck (1976). Moreover, such a comparison allows to follow the variations of the magnetic field intensity from observed variations of polarization degree and spectral index.

In this report we present a result of such comparison for two well-known blazars 3C 66A and OJ 287. It was shown that in both sources the decrease of polarization and spectral index indicate: an increasing disorder of magnetic fields of relativistic jets.

References

Nordsieck K.H.: *ApJ*, 1976, **209**, 653.