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SPECTROPOLARIMETRIC MONITORING OF THE SEYFERT GALAXY 3C 390.3 ON 6m TELESCOPE SAO RAS

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In 2008-2013 we carried out monitoring spectropolarimetric observations of the Seyfert galaxies 3C 390.3 (13 epochs) with the 6-meter telescope of SAO RAS with two variants of the spectrograph with a spectropolarimeter: SCORPIO-1 and SCORPIO-N in the spectral range (3500-9400) with the spectral resolution ∼40A and ∼10A, and the precision of linear polarization $< 0.3\%$ and $< 0.1\%$, respectively; the precision of instrument polarization $\sim 0.05\%$; We are analysed the results of spectropolarimetric observations of 3C390.3, using also some data from literature,(over 18 years, 1995-2013) and determined the Stokes parameters Q, U, degree of linear polarization P and the position angle of the polarization plane PA for continuum and for the emission line Ha, and also their variations with time. The following main results are received: integral flux and degree of polarization changes about twice; in continuum the linear polarization slightly increases as the wavelength decreases; in the Ha region the linear polarization is $\sim 1\%$ less than in continuum and its shape is box-like, without any structural details; in the region of lines and continuum the polarization angle (PA) of the E vector of linear polarization was changing during the monitoring period (18 years) by ∼(10-25) degrees; in polarized light the broad lines shifted by the value of order 10^3 km/s to blue side relative to the systematic velocity were observed in the region of Ha and Hb; an anticorrelation of polarization plane angle variation in time relative to the continuum level was detected etc.

Delays (lags) between the polarized continuum and Ha and direct light from continuum and from Ha line are estimated.

We considered a model in which polarization in continuum results from vector addition of the slow-changing polarization of disk whose direction coincides with the jet direction, and the fast-changing polarization caused by synchrotron emission of the jet, whose polarization vector is approximately perpendicular to the jet direction. Thus, besides the fast-rotating Kepler disk forming broad hydrogen lines, the radial outflow of hot BLR gas with velocity of order of 1000 km/s is observed in the central region. This flux induces the polar scattering of continuous emission of the accretion disk, which leads to the observed depolarization of continuum emission under broad hydrogen lines.