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NIGHT TO NIGHT VARIABILITY OF THE EMISSION LINES IN THE NUCLEAR SPECTRUM OF THE SEYFERT GALAXY NGC 3227

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Night-to-night variability of the optical emission lines from the nucleus of NGC3227 was observed from data obtained with the 6 m telescope.

Spectral observations of the galaxy NGC 3227 were carried out with the 6 m telescope at the Special Astrophysical Observatory, in January 12–15, 1977, during the maximum brightness phase of the nucleus of this galaxy. The spectrograph slit, spectral dispersion, and the spectral resolution were about 1″, 93Å/mm, 8 Å, respectively. Fifty three spectrograms formed the basis for the investigation of the emission line variability on time scales of several days.

Emission line profiles – The spectra showed variations in the width of the line profiles at 0.25 and 0.50 intensity levels in comparison with the profile peak. The resulting emission line profile widths were grouped by dates on which they had similar values. Figure 1 shows that the line profile widths on the second and third days were greater than those on the first and fourth days. Symbols 1–4 in Figures 1 and 2 are the observational dates. The difference of the with of the Hγ profile at 0.50 intensity level was greater than 3σ.

Variability of the Equivalent Width – The EW(λ) of the emission lines are shown in Figure 2. From the first to the second night the reduction of EW(Hβ) and the EWO[OIII]$\lambda\lambda$4959+5007 were a factor of 1.5 and 1.4, respectively (see Figure 2 left-side). The EW[OIII] increased from night 2 to night 4 by more than 3σ. In Figure 2 (right-side) we show the inverse changes of the EW[SII]$\lambda\lambda$6717+6731 and EW[OIII] from the first to the fourth day. Analogous changes of EW[SII]$\lambda\lambda$6717+673 and EW[OIII] were found at rather high level of significance for the nuclei of the Seyfert galaxies NGC 1275 and NGC 7469.

The result of the emission line variability investigation in the spectrum of NGC 3227 galaxy includes the suppositon that during three days there was a flare in the Hα, Hβ, Hγ emission region (Metik et al. 2006).

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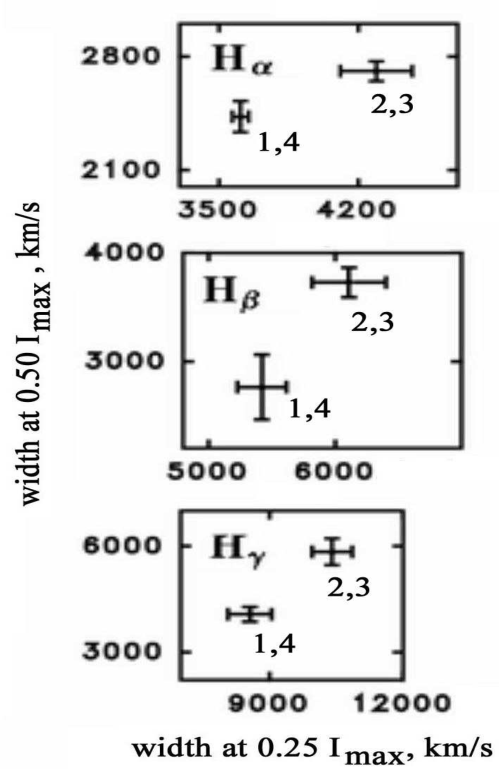

Fig. 1. Difference in the widths of the emission line profiles at levels of 0.25 and 0.50 of the profile peak between 2,3 days and 1,4 days.

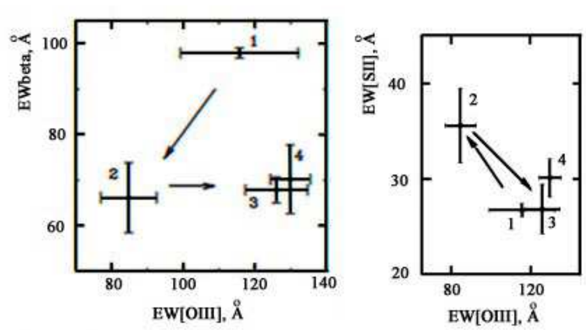

Fig. 2. Day-to-day variations of EW(Hβ) and EW[OIII](left) and of EW[SII] and EW[OIII] (right).

REFERENCES

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