

UV VARIABILITY OF A LARGE SAMPLE OF AGN

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The IUE-ULDA database (Version 3.0, complete until the end of 1988) contains about 3500 spectra of more than 500 AGN of different classes (see Courvoisier and Paltani, IUE-ULDA Access Guide No. 4 A & B, ESA SP 1153 A & B 1992). We selected 67 objects for which the variability properties could be investigated. For each object we estimated the amplitude of the variability by means of the standard deviation $\sigma(\lambda)$ of the flux at different frequencies divided by the mean flux.

We characterise the variability as a function of wavelength using a linear representation:

$$\sigma(\lambda) \approx \nabla_{\lambda}(\sigma_f) \cdot \frac{\lambda - 2000 \text{ \AA}}{1000} + \sigma_{f,2000}$$

$\sigma_{f,2000}$ is the variability at 2000 Å expressed as a fraction of the mean flux and $\nabla_{\lambda}(\sigma_f)$ is the wavelength gradient of the variability in fraction/(1000 Å).

The main conclusions of this study are:

- $\sigma_{f,2000}$ (the variability) is found to be larger than 20 % in about 80 % of the objects. Variability appears to be the rule in the UV domain.
- Most of the objects have a negative value of $\nabla_{\lambda}(\sigma_f)$, indicating that the variability is larger at small wavelength than at long wavelength.
- We tried to compare the distributions of $\sigma_{f,2000}$ and $\nabla_{\lambda}(\sigma_f)$ among different subclasses of AGN: BL Lac objects, Seyfert 1 galaxies, radio-quiet and radio-loud quasars. The distribution of $\sigma_{f,2000}$ is probably different for BL Lacs objects from the one of the other subclasses, but mean variabilities are within 1 σ from each other. Mean values of $\nabla_{\lambda}(\sigma_f)$ are also within 1 σ from each other.
- We examined the relation between $\sigma_{f,2000}$ and the luminosity. We found that there is a weak trend for the variability to decrease with the increase of the luminosity. The correlation coefficient indicates that the trend has a 90 % probability of being real. In this case, the mean variability changes from 42 % to 31 % from low to high luminosity AGN over 5 decades. Even if this correlation is confirmed, the small value of the slope makes the models in which the luminosity is due to a number of independent events (supernovae, outbursts) inconsistent with the observations. In these models the variability should decrease with the square root of the luminosity.

A more complete study, based on ULDA 4.0, complete until the end of 1991, is in progress and will appear in a paper.