# CAN BL LAC NUCLEI AND BROAD LINE REGIONS COEXIST?
# OR
# WHEN IS AN OBJECT A BL LAC?

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The problem of BL Lac classification is a long standing one and it is mainly due to the subjectiveness of selection criteria used in the definition of BL Lac samples. For instance, an object will undoubtedly be classified as a BL Lac if it shows flat radio spectrum, high optical and radio polarization, featureless optical continuum with weak or absent emission lines, and variable flux and polarization. However, the problem arises when the object shows some but not all of these properties. In face of this difficulty, different authors (Stickel et al. 1991, Stocke et al. 1991) have tried to make a systematic analysis of the data and it has been common to classify as BL Lacs those objects whose strongest emission lines have equivalent width (EW) $\leq$ 5 Å. Another common criterion is to require the 4000 Å break contrast to be $\leq$ 0.25. Nevertheless, both of these criteria are rather arbitrary and more directly related to practical observational considerations, than they are to any physical distinction between objects. What is proposed here is a slightly different approach; it is proposed that we take a step back from common classification and that instead of imposing strict selection criteria, we create a multi-observational parameter space to investigate any breaks in the distribution of observed properties that will help clarify the distinction between BL Lacs and other flat radio spectrum sources.

With this aim in mind, a new sample containing 55 optically bright flat radio spectrum sources with a flux density limit of 200 mJy has been selected and observed (Marchã et al. 1995: in press) such that the distribution of objects can be discussed according to the percentage of optical and radio polarization, the 4000 Å break contrast, and the EW of emission



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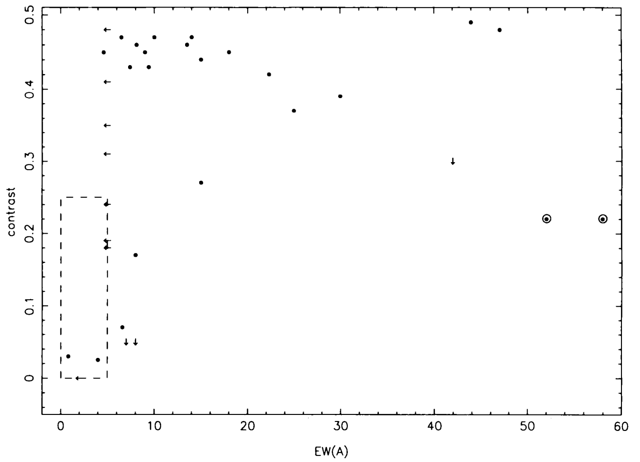


*Figure 1.* 'Contrast vs. EW' plot for the 200 mJy sample. This plot leaves out 10 sources with Sy-type spectra which have emission lines with EW > 100 Å. The arrows represent upper limits and the centered circles the 2 'hybrid-type' objects mentioned in the text.

lines. Here, however, only the latter two will be discussed. The distribution of break contrast vs. EW of the strongest emission line for EW up to 60 Å is plotted in Fig. 1. This leaves out 10 sources with "Sy-type" spectra whose emission lines have EW > 100 Å. The sample can be divided in two broad categories, one containing the sources with 4000 Å break contrast > 0.4 (galaxies), and the other containing the objects with the break contrast ≤ 0.4. Among this latter category, three types of sources can be identified: the "BL-type" objects (those with EW ≤ 30 Å), the "Sy-type" objects (those with EW ≥ 100 Å), and finally two objects with "hybrid type" properties, i.e., with broad but relatively weak (50 ≤ EW ≤ 60 Å) emission lines. The fact that BL Lacs do not seem to be restricted to the area enclosed by EW ≤ 5Å and break contrast ≤ 0.25, but instead seem to occupy a larger area of the parameter space, makes the point very clear that there is the need for a wider, yet more systematic BL Lac classification. Furthermore, classification should take into consideration a wide range of parameter space involving several observational parameters.

## References

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