

Chapter 13 : Analysis and Discussion of Individual BALQSOs

Several of objects presented in chapter 12 deserve individual discussion. In order to better show the time variability characteristics of these objects, we have transferred the data in table 12 into graphical form in figure 13-1. This figure contains time curves for various spectral measurements and broadband observations. Only selected measurements are presented. The broadband measurements are given in terms of relative intensity (rather than magnitudes as in figure 8-1) and are indicated by either R_s or V2 on the left hand side of the plot. The continuum slope, α_{UV} , is the same as α which is presented in column 4 of table 12-1, and is calculated as described in chapter 12.

The BELs are given as relative emission-line intensities, which are calculated by multiplying the REW by the relative flux, and rescaling to a mean of one. This neglects any change in the continuum slope. This means that a BEL with constant REW will show intensity changes in synchronous with the broadband measurements, implying that the broad emission is responding with the continuum flux. Conversely, the line intensities which remain constant, means that the REW changed such as to imply that the broad emission does not respond to changes in the observed continuum. The response, lack of response, or delayed response of the BEL intensities relates to the size of the BELR and/or the correlation between the observed and ionizing (far UV and soft X-ray) continuum. It can also indicate how much of the BEL comes from the BALR— since we expect that the BALR is further from the continuum source than at least part of the BELR, it should respond much more slowly or perhaps not at all.

The BAL time variability relates directly to the ionizing continuum and the ionization parameter, as will be discussed in the following sections.

13.1 : 0019+0107 (UM 232)

This was the first object in which large ($\Delta(\text{residual intensity}) \gtrsim 0.3$) BAL changes were seen (Barlow, Junkkarinen, and Burbidge 1989, hereafter BJB). After comparing