

in BAL strength (evident in figure 12–3), indicating that the troughs were returning, at least partially, to their previous strengths. The increase in absorption appeared to occur in Si IV, C IV, and N V, and was coincident with the decrease in continuum strength. This suggests that $U > U_p(\text{N}^{+3})$, and a similar set of conclusions can be made, regarding the aluminum and silicon enhancement, as were made for UM 232.

It might be possible, to reconcile the patterns of continuum level changes and BALs, if we speculate that the ionizing continuum is only “loosely” correlated with the observed continuum, and that the changes in the ionizing source are delayed relative to the observed continuum. We note that more exotic mechanisms for change (such as relativistic particles) cannot be ruled out as long as those mechanisms propagate at relativistic speeds and correlate, at least loosely, with the continuum (photon source) variability.

13.4 : H 0846+1540

This was the first BALQSO in which a definite correlation was seen between variations in the BALs (decreasing strength) and the observed continuum level (increasing), (Barlow *et al.* 1992b). This object might be considered a “marginal” BALQSO (see chapter 4), especially after the decrease in BAL strength. In this object, we see three distinct systems of apparently intrinsic absorption. At low velocities ($\sim 0.01c$) we see a system of narrow lines, reminiscent of associated absorption line systems (see §1.2). The lines show no apparent changes, probably because they have relatively higher optical depths. At high velocity ($\sim 0.08c$), we see a weak, relatively smooth BAL, this BAL showed the largest change. At moderate velocity ($\sim 0.03c$), we see a small, weak system which seems to be intermediate between the other two systems in terms of “smoothness”. This BAL also showed variation, presumably because the optical depth was somewhat lower than in the low velocity system.

At high velocity, the N V BAL also showed a decrease in absorption strength. This, along with the brightening of the QSO, implies U is greater than $U_p(\text{N}^{+4})$. Let us assume