S/N will have a big effect on (a) if the frequency and amplitude of variations vary as a function of redshift. For example, if high redshift QSOs vary more frequently but with smaller amplitudes, then low S/N data will systematically select lower redshift objects as being more variable. Also, objects which tend to show large, infrequent "flares" will be selected by long timespan observations.

Group 4 claims that the decrease in variability with redshift seen by other groups is due mainly to (b) and (d). They claim that a long enough baseline should avoid any time dilation effects, although this assumes a limit on the timescale and frequency for variations. Also, longer observing timespans (in the QSO rest frame) will still select out any very infrequent flares.

Our observations show a possible excess in the probability (or frequency) of variability at high redshift. We also note that our sample tends to have more high redshift QSOs (11 QSOs with $z_e \gtrsim 2.6$) than the other groups, which means we may be sampling a different population. Note that if we ignore the QSOs beyond $z_e \sim 2.5$ in the lower left graph of figure 8-2, we eliminate the increase in variability and actually may have a slight decrease in variability with redshift. It seems reasonable to assume that the possible decrease in variability up to $z_e \sim 2$ in our data (figure 8-2) is due to time dilation. In this case, our data is consistent with the speculation that the *frequency* of variability is relatively constant until $z_e \sim 2.5$, at which point it increases with redshift.

8.5 : Speculations on Variability Increasing with Redshift

8.5.1 : Rest Wavelength Dependent Variability

A study by Edelson *et al.* (1990) on Seyfert galaxies has shown an apparent increase in the ultraviolet spectral index (α, $f_\nu \propto \nu^\alpha$) as the luminosity increased for a given Seyfert galaxy. This effect has also been seen in QSOs (Kinney *et al.* 1991). If this is the case, then the amplitude of variations will increase with decreasing rest wavelength. Giallongo *et al.* (1991) have suggested that it is possible that there is no change in the *intrinsic*