optical depths of BALs, and the ionization parameter, we have N(H)$\sim 10^{19}$ (see chapter 3). From the [O III] limit, we have $n_e > 10^6$. This means that: $\epsilon \lesssim 10^{-5}$.

The average cloud size (r_c) is given by: $n_e \eta r_c \sim$ N(H), where η is the number of clouds along the line-of-sight. From the lack of structure seen in some smooth BAL troughs down to a resolution of $\sim$60 km s^{-1} (*cf.* Turnshek *et al.* 1988), we can argue that the velocity width of individual clouds is smaller than this resolution,‡ and so $\eta \gtrsim 200$ for troughs with widths $\gtrsim$10,000 km s^{-1}. From this we get: $r_c \lesssim 5 \times 10^{10}$ cm.

2.7 : Geometry of the BALR

A variety of structures are possible for the BALR– spherical, disk-like, or jet-like. However, from small covering factor arguments, a spherical pattern must be patchy or sponge-like, rather than symmetric on all angular scales. Also, if some part of the BELs come from BALR gas, some of the BALR must lie (relatively) perpendicular to our line of sight such that the velocity component along our line-of-sight is small.

It is argued that some part of the N V λ1240 BEL comes from the BALR (since it is enhanced in BALRs, Weymann *et al.* 1991), and that the symmetry of this emission argues against a jet-like structure, and favors a disk-like or spherical symmetry (Turnshek 1988). If all QSOs have a BALR, this may also favor a disk like structure in order to preferentially emit N V along our sight line in BALQSOs (Turnshek 1988)– however this requirement may be avoidable (see Morris 1988 and §2.1).

It is also possible that the BALR originates just above the edge of an obscuring torus surrounding the central engine (J. Miller, private communication), and we see BALs when our line-of-sight approaches this edge. This has the advantage of explaining the discovery rate of BALQSOs, providing an origin for the BALR material, and providing a connection

‡ The smooth, uniform, monotonically changing depth of some BALs probably requires individual cloud velocities much smaller than this, in order to avoid structure. However, very small clouds may be subject to evaporation or fluid instabilities (see Junkkarinen *et al.* 1983 and references therein).