WKB approximation (Goodman & Ryu), has been used to suggest that angular momentum transport is usually *inward* which is incompatible with a self-consistent accretion disk model. Here we examine the linear modes of convective instability in thin, low mass, accretion disks including the full radial structure of such modes. We have calculated the Eulerian angular momentum transport since this allows us to include the effects of mixing regions with different specific angular momenta. Our results can be summarized as follows. First, we find that linear modes exist for only a discrete set of k_z/k_θ. These values are roughly equally spaced. The minimum value and spacing are both monotonic functions of the maximum convective growth rate, Γ_c, and increase linearly with Γ_c for $\Gamma_c > \Omega$. Second, for any allowed value of k_z/k_θ there are solutions for all growth rates between 0 and Γ_c. Solutions with Γ close to Γ_c have large radial gradients. As Γ increases within this range the direction of angular momentum transport goes from positive to negative. Third, for a given Γ_c solutions with negative angular momentum transport tend to dominate as k_z/k_θ increases. Fourth, if we characterize modes by their ability to resist dissipation, then inward angular momentum transport appears to be slightly favored. Finally, including MHD effects will substantially modify this conclusion and may lead to outward angular momentum transport in conducting (ionized) disks.

McDONALD OBSERVATORY – *HUBBLE SPACE TELESCOPE* SPECTROSCOPY OF THE NARROW LINE REGION OF HIGH LUMINOSITY ACTIVE GALACTIC NUCLEI

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We have made high signal-to-noise spectroscopic observations of 7 radio-loud quasars with the Faint Object Spectrograph on the *Hubble Space Telescope* and from the ground at McDonald Observatory and at Kitt Peak National Observatory. The resolution is 300 - 400 km s^{-1} over the wavelength range 1000 - 8500 Å, enabling us to separate the broad and narrow components of the emission lines. This is the first study of the optical and UV narrow lines in such high luminosity AGNs.
The most important and striking observational result is the relative weakness of the narrow ultraviolet lines, assuming that they have the same widths as the narrow [OIII] λ5007 emission lines. We do not have a single definite detection of a narrow UV line in any of the 7 quasars.
We have measured all the strong optical narrow lines

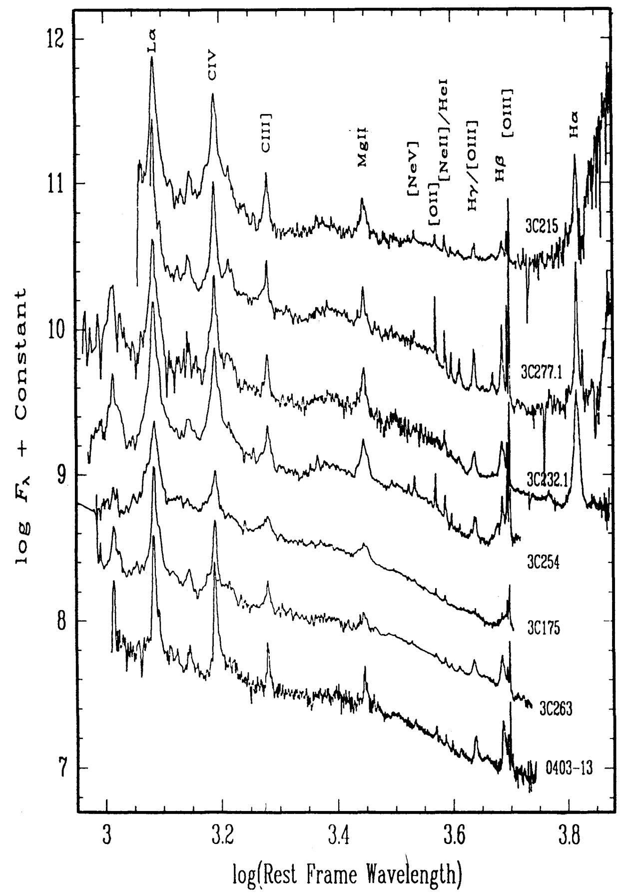

FIG. 1.— Sample *HST*-McDonald-KPNO spectra illustrating the wide wavelength coverage. The ordinate is plotted on displaced scales, and data have been smoothed for display. The vertical bars indicate positions of atmospheric A- and B-band absorption that have been divided out in the McDonald data, and omitted from the long-wavelength spectra of 3C 215, 277.1, and 323.1 (A-, A-, and B-band respectively).

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and have derived upper limits to the strengths of narrow lines in the UV. The latter are much weaker than predicted by dust-free photoionization models and also weaker than those typically seen in Seyfert 2 galaxies and narrow-line radio galaxies. There is direct evidence for the presence of dust with significant reddening, typically $E(B-V) \sim 0.5$. A comparison of our sample with the previously observed Seyfert 2s (Kinney et al. 1991) shows that two explanations for the reddening are needed. One is simple foreground reddening, presumably in the host galaxy. However some narrow line spectra show an unusually weak $Ly\alpha/H\beta$ intensity ratio, but apparently Case B $H\alpha/H\beta$. We interpret this as the result of dust inside the narrow line clouds and show model calculations to support this claim.

These results are based on observations with the NASA/ESA *Hubble Space Telescope* obtained at the STScI, and at KPNO, NOAO which are operated by AURA, Inc., under contract with NASA and NSF.

A detailed version of this contribution can be found in Wills et al. 1993, ApJ, 410, 534.