

ABSTRACTS OF CONTRIBUTED PAPERS/RESUMENES DE CONTRIBUCIONES

A NEW INTERPRETATION OF BROAD EMISSION
LINE WIDTHS IN HIGH LUMINOSITY AGNs

M. S. Brotherton & Beverley J. Wills 223

NEAR-INFRARED MOLECULAR HYDROGEN EMIS-
SION AS A PROBE OF THE STRUCTURE AND
ENERGETICS OF PHOTODISSOCIATION REGIONS

M.L. Luhman, D.T. Jaffe, & L.D. Keller 223

HELIUM-LIKE IRON LINE TEMPERATURE DIAG-
NOSTICS IN CLUSTERS OF GALAXIES Douglas A.

Swartz & Martin E. Sulkkanen 224

THE LINEAR THEORY OF CONVECTIVE INSTABIL-
ITIES IN ACCRETION DISKS E.T. Vishniac, S. Luo,
& P.H. Diamond 224McDONALD OBSERVATORY - HUBBLE SPACE TELE-
SCOPE SPECTROSCOPY OF THE NARROW LINE
REGION OF HIGH LUMINOSITY ACTIVE GALACTIC
NUCLEI Beverley J. Wills, H. Netzer, M.S. Brotherton,
Mingsheng Han, D. Wills, J.A. Baldwin, G.J. Ferland, &
I.W.A. Browne 225A NEW INTERPRETATION OF BROAD
EMISSION LINE WIDTHS
IN HIGH LUMINOSITY AGNs

M. S. Brotherton and Beverley J. Wills

McDonald Observatory and Astronomy Department,
University of Texas, Austin

We present the results of our recent statistical investigations of broad emission line profiles (the $\lambda 1400$ feature, C IV $\lambda 1549$, C III] $\lambda 1909$, and Mg II $\lambda 2798$) in high quality spectra of intermediate and high redshift QSOs (originally observed by Sargent, Steidel, & Boksenberg for Lyman limit, C IV, and Mg II absorption line studies). Approximately 200 spectra are involved. The most striking trends are found with increasing line width ($\geq 3\sigma$, several $> 8\sigma$): the intensity ratios C III]/C IV, Mg II/C III], and $\lambda 1400$ /C IV increase, the equivalent width of C IV decreases, the C IV profile becomes less-sharply peaked, and the peaks of C III] and C IV become increasingly blueshifted relative to the peak of Mg II. Traditionally, the line width has been interpreted as a measure of the typical velocities reflecting the dynamics of a single zone. We suggest that different line widths may be the simple consequence of having two kinematically distinct zones, with differing emission from each region in different objects.

We describe our line profiles with an empirical two Gaussian scheme: a blueshifted ($\sim 1000 \text{ km s}^{-1}$) broad (FWHM $\sim 7000 \text{ km s}^{-1}$) base and a narrow (FWHM $\sim 2000 \text{ km s}^{-1}$) core. Profiles generated in this way can reproduce, in general, the observed trends with line width (line shape, asymmetry, and line shift) although additional assumptions are needed to account for the correlations with the line ratios. We discuss some mechanisms which may give rise to two such quasi-independent components.

NEAR-INFRARED MOLECULAR
HYDROGEN EMISSION AS A PROBE
OF THE STRUCTURE AND ENERGETICS
OF PHOTODISSOCIATION REGIONS

M.L. Luhman, D.T. Jaffe,

and

L.D. Keller

University of Texas at Austin

We have mapped the $v=1-0$ S(1), $v=2-1$ S(1), and $v=6-4$ Q(1) near-infrared emission lines of molecular hydrogen in several extended photodissociation regions, including the Orion A molecular cloud. We