THE REDSHIFT DIFFERENCE BETWEEN THE BROAD AND NARROW EMISSION LINES IN OQ 208 = MRK 668 AND OTHER GALAXIES

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OQ 208 is a well-studied radio object with a curved spectrum broadly peaked near 7.9 GHz. It has previously been identified with Mrk 688, a compact galaxy with strong broad H\textsc{i} emission lines and narrow forbidden lines. Scans taken at Lick Observatory show that its spectrum is fairly typical of a broad-line radio galaxy, except that there is a large difference in redshift between the broad and narrow lines $\Delta z = z(\text{broad}) - z(\text{narrow}) = +0.0094 = 2800 \text{ km sec}^{-1}$. The broad H\textalpha{} and H\textbeta{} emission-line profiles are significantly different from one another. In addition, the optical spectrum varied between August 1978 and June 1979, the continuum and broad lines becoming about 0.25 magnitude fainter, while the narrow lines remained to a first approximation unchanged. Somewhat smaller redshift differences of the opposite sign have previously been observed in the broad-line radio galaxies 3C 227 and 3C 382.

If the redshift difference in Mrk 688 is due to a gravitational redshift in the small, dense, broad-emission-line emitting region, for an assumed radius 0.03 pc a central mass $\sim 6 \times 10^9 \text{ M}_\odot$ would be required. This interpretation would not explain the different H\textalpha{} and H\textbeta{} profiles. It is more likely that the physical situation in Mrk 688 is related to the situation in Seyfert 1 galaxies with asymmetric line profiles extending to long wavelength. The ten Seyfert 1 galaxies with the most asymmetric profiles in our survey are Mrk 279, 304, 374, 376, 817, 871, 1040, Akn 120, 374, and III Zw 2. Among these objects $\Delta z$ ranges from $+0.0040$ up to $+0.0076$. The interpretation suggested for these profiles by Shields; Capriotti, Foltz and Byard; and Ferland, Netzer and Shields is that the system of dense clouds that emit the broad lines are moving away from the central continuum source and that Balmer-line self-absorption and/or dust make the clouds going away from the center apparently brighter. Mrk 688 would then be an object with a relatively smaller amount of emission from the dense clouds, but a somewhat higher mean outward flow velocity. Calculations of further models of this type for comparison with the observed profiles would be highly desirable.

THE COSMOLOGICAL CONSTANT, COSMOLOGICAL TESTS, AND GALAXY CLUSTER SIZES

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While in the past some constraint on the cosmological constant facilitated data reduction, current cosmological data are of sufficient quality at large $z$ to allow such constraints to be dropped. Hence, more of the information content of the data can be utilized in a noncosmological context. We present an example using the $\theta-z$ relation. Based on 99 galaxy clusters we show that the assumptions of a Friedmann Universe and no galaxy cluster size evolution are mutually incompatible.

IONIZED GAS AROUND THE NUCLEI OF ACTIVE GALAXIES: FIRST MONOCHROMATIC VIDEO CAMERA IMAGES

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Images of the Seyfert or Seyfert-like galaxies NGC 1068, NGC 1275, NGC 3516, 3C 120, Mrk 1, Mrk 3, and Mrk 6 have been obtained using a linear high-gain television system at the Kitt Peak National Observatory. Exposures were made through $\sim 50 \text{ A}$ filters tuned to various emission lines including $[\text{O}\text{m}] \lambda 5007$ and H\textalpha{} as well as the adjacent off-line continuum; and after calibration, the continuum exposures were digitally subtracted so as to remove stellar light. In almost every case, an emission-line region extends...