A NUCLEAR LUMINOSITY FUNCTION FOR SEYFERTS

E.J.A. MEURS
Dunsink Observatory
Castleknock, Dublin 15, Ireland

Abstract. Relations between various classes of AGN should show up when examining their LFs. For Seyfert galaxies, such studies have been affected by the prevalence of (essentially) integrated magnitudes. Proper nuclear magnitudes have been determined in an effort of CCD imaging, which enable an appropriate comparison with QSOs.

One way to assess populations of extragalactic objects is offered by their luminosity functions (LFs). Applied to QSOs, radio galaxies, BL Lacs and Seyferts, evolutionary relationships between these categories of AGN, but also with normal galaxies, may be investigated. For an evaluation of the likely connections between Seyferts and QSOs, a potentially serious complication is that most of the magnitudes for Seyfert galaxies refer to rather large apertures. Whereas QSOs are dominated by exceptionally bright cores, the larger aperture magnitudes often only available for Seyferts include substantial contributions from the galaxies themselves. This could notably have influenced discussions of the LF of Markarian Seyfert galaxies such as in Meurs & Wilson (1984).

In order to overcome this contamination from underlying galaxies a dedicated programme of Seyfert photometry was carried out. Short exposure CCD frames in the b band were obtained for some 75 (mostly Markarian) Seyfert galaxies, with the 2.2 m telescope at Calar Alto. Aspects of the data handling have been described in Meurs (1986) and Meurs et al. (1991). The CCD data allow convenient centering on the galaxy nucleus and a suitable extraction area of desired small size is easily selected. Thus, the photometric data will be restricted to the centremost area only. An extraction area of 3 arcsec around the galaxy nuclei was chosen. Detailed photometric data for several Seyferts as available in the literature show that any contribution from the underlying galaxy is not very significant.

R. Ekers et al. (eds.), Extragalactic Radio Sources, 541–542.

The nuclear magnitudes obtained in this way were used to determine an optical nuclear LF (adjusted to B magnitudes) for Markarian Seyfert galaxies, in a fashion similar to the methods employed by Meurs & Wilson (1984). The interesting result is that towards the most luminous Seyfert nuclei the new (nuclear) LF runs close to the former Seyfert LF and the QSO LF. This means that the older (wider aperture) photometric data for the most luminous Seyferts were already dominated by very strong nuclear emission, confirming a conclusion of Meurs & Wilson (1984), and that the continuity of Seyferts with QSOs remains a notable feature also for a LF based on nuclear magnitudes. The latter result will be of importance to evolutionary scenarios linking Seyferts with QSOs.

References

Meurs, E.J.A. (1986) in *The optimization of the use of CCD detectors in astronomy*, Baluteau & D'Odorico (Eds), p. 105

Meurs, E.J.A. and Wilson, A.S. (1984) A&A 136, 206

Meurs, E.J.A., Bonifacio, V. and Lima, N. (1991) *3rd ESO/ST-ECF Data Analysis Workshop*, Grosbol & Warmels (Eds), p. 45