

EXTENDED EMISSION IN BL LAC OBJECTS

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The study of the extended emission and polarization properties of BL Lacs is an important step for the identification of their parent population. FRI radio sources, the supposed parent population of BL Lacs, have weaker extended radio luminosity and a dominant inferred magnetic field perpendicular to the jet, while FRII radio sources, the supposed parent population of quasars, have stronger extended radio power and an inferred magnetic field parallel to the jet. The only complete sample of radio selected BL Lacs (1 Jy sample, Stickel et al. 1991, *ApJ*, **374**, 431) contains 34 objects. Unfortunately, about half of 1 Jy BL Lacs do not have very high dynamic range images, necessary to detect the low emissivity radio emission surrounding the bright compact source, either because the object was never observed, or because the observation was carried out at the beginning of 1980s with low sensitivity. In 1994 we started a programme using the VLA (A, B, and D configuration, see Table 1) and the WSRT (W in Table 1) to complete the high sensitivity radio imaging of the 1 Jy sample. We aim to investigate morphology and polarization properties, as well as the luminosity of the extended emission. This contribution presents the L band observations. The results are very preliminary, some of the data reduction is still in progress as well as the statistical analysis. The sources in Table 1 have been roughly classified as extended (E), or point-like (P) if no extended feature was detected. Among the 15 sources observed at the highest resolution 13 were classified as extended. In many sources we detect significantly much more extended flux than previously reported from earlier observations. Almost all the BL Lac objects we observed at the highest resolution show some extended features; furthermore, in a few cases, we detected emission on the arcminute scale. The power of the extended luminosity covers 3 orders of

TABLE 1. For the sources with extended features, the Table lists the redshift, the largest angular sizes in arcsecond and kpc, the flux density and the power of the extended emission ($H_0 = 100 \text{ kms}^{-1}\text{Mpc}^{-1}$). When a redshift was not available we used a value of 0.5, close to the median value for the redshift distribution of the 1 Jy sample.

IAU Name	Obs.	Morph.	z	LAS arcsec.	LAS kpc	S_{ext} mJy	$P_{1.4}$ $\times 10^{24} \text{ W/Hz}$
0048–097	A,B,D	E		28	100	130	34.8
0118–272	A,B,D	E	>0.557	35	130	105	32.6
0138–097	A,B,D	E	>0.501	20	71	27	7.3
0426–380	A,B,D	E	>1.030	5	21	16	18.2
0454+844	W	P					
0537–441	A,B,D	E	0.896	17	71	187	160.6
0716+714	W	E		41	146	180	48.2
0814+425	W	E	0.258	24	60	15	1.1
0820+225	D,W	E	0.951	25	107	124	120.0
0823+033	D	P					
0828+493	W	P					
0851+202	W	P					
0954+658	A,B,D,W	E	0.367	7	22	16	2.3
1144–379	A,D	P					
1147+245	A,B,D,W	E		38	135	48	12.8
1308+326	D,W	P					
1418+546	D,W	E	0.152	227	393	86	2.1
1514–241	A,B	E	0.049	57	38	134	0.3
1519–273	A,B	P					
1652+398	A,B	E	0.033	35	16	74	0.1
1749+701	W	P					
1803+784	A,B,D,W	E	0.684	95	376	35	17.5
1807+698	A,B,D	E	0.051	341	260	961	2.7
1823+568	W	E	0.664	32	126	114	53.8
2007+777	W	E	0.342	52	154	41	5.1
2131–021	A,B,D	E	0.557	70	260	92	30.5
2240–260	A,B,D	E	0.774	24	98	344	220.5
2254+074	D	P					

magnitude, 3 objects (0537–441, 0820+225, and 2240–260) have values typical of a FR II radio source. These new data will be used for an updated statistical analysis of the properties of the extended emission in the 1 Jy sample of BL Lac objects.

Acknowledgements: MB and DD acknowledge for financial support the European Union EU Fellows under the contract CHBGCT920212.