The Detectability of Seyfert 2 Galaxies with Hidden Broad-Line Regions

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The detectability of Seyfert 2 galaxies (Sy2s) with hidden broad-line regions(HBLRs) is still a question open to debate. Using a large sample of 90 Seyfert 2 galaxies (Sy2s) with spectropolarimetric observations (Gu & Huang 2002), we tested the suggestion that the presence of hidden broad-line regions (HBLRs) in Sy2s is dependent upon the Eddington ratio (Nicastro *et al.* 2003). The stellar velocity dispersion and the extinction-corrected [O III] luminosity are used to derive the masses of central super-massive black holes and the Eddington ratios. The main conclusion are summarized as follows.

• There is no obvious discrimination in Eddington ratios for Sy2s with and without HBLRs.

• The detectability of HBLRs is low for Sy2s with low-luminosity and low Eddington ratios regardless of the column density of neutral hydrogen

• For high-luminosity Compton-thin Sy2s, we find a very higher detectability of HBLRs ($\sim 85\%$).

In the future, we need more new data of hard X-ray spectra with good quality optical spectropolarimetric information to confirm this suggestion. Refer to Bian & Gu (2006) for detail.

References

Bian W. & Gu Q. 2006, *ApJ*, submitted
Gu Q. & Huang J. 2002, *ApJ* 579, 205
Nicastro F., Martocchia A., Matt G. 2003, *ApJ* 589, L13

Type (1)	$\log(M_{BH}/M_\odot)$ (2)	SD_1 (3)	N1 (4)	$\log(L_{bol}/L_{Edd})$ (5)	SD_2 (6)	N2 (7)	f_{60}/f_{25} (8)	SD_3 (9)	N3 (10)
non-HBLRs Sy2s	7.22± 0.10	0.57	36	-0.47± 0.16	0.93	34	5.08±0.39	2.67	46
HBLRs Sy2s	7.33± 0.10	0.51	24	-0.07± 0.16	0.79	24	2.50±0.21	1.30	39
A:non-HBLRs Sy2s	7.23± 0.10	0.55	33	-0.46± 0.17	0.95	31	4.86±0.40	2.61	42
A:HBLRs Sy2s	7.33± 0.11	0.52	22	-0.04± 0.16	0.79	23	2.43±0.21	1.26	36
B:non-HBLRs Sy2s	7.24± 0.13	0.54	16	-0.47± 0.22	0.87	16	5.62±0.67	2.85	18
B:HBLRs Sy2s	7.34± 0.13	0.56	19	-0.07± 0.17	0.73	19	2.46±0.23	1.10	24
C:non-HBLRs Sy2s	7.33± 0.11	0.53	25	-0.78± 0.19	0.91	23	5.43±0.48	2.84	35
C:HBLRs Sy2s	7.33± 0.12	0.52	20	-0.17± 0.16	0.72	20	2.58±0.23	1.37	35

Table 1. The distributions of SMBHs masses, the Eddington ratios and f_{60}/f_{25} for HBLRs Sy2s and non-HBLRs Sy2s. A: unabsorbed Sy2s ($N_H < 10^{22} cm^{-2}$) excluded from the sample. B: Sy2s with $N_H > 10^{22} cm^{-2}$. C: Sy2s with the direct σ_* measurements.