

The Optical Spectroscopic Properties of Seyfert 1 Galaxies Selected from Ultraluminous Infrared Galaxies

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Abstract. The ultraluminous infrared galaxies (ULIRGs) are strong interacting or merging galaxies. Statistical study shows that about ten percent of ULIRGs are QSOs or Seyfert 1 galaxies, and high-resolution HST images suggest that they are likely to be at the post merger stage. We investigate the optical spectroscopic properties for a complete sample of 28 QSOs/Seyfert 1s selected mainly from the IRAS galaxy redshift survey QDOT and 1.2 Jy catalogs. The optical spectra were obtained with the 2.16 m optical telescope of the Beijing Astronomical Observatory between October 1998 and the end of 1999. Statistical results for both continuum and emission lines show the following:

1. Most of our sample galaxies are strong or extremely strong FeII emitters with a ratio of FeII/H β larger than 2. There also exists an anti-correlation of the ratio of FeII/H β with EW(OIII) and FWHM(H β).

2. We fit the continuum for all sample galaxies. Aside from a few objects which could be fitted well by a power-law model, the continuum for most sample Seyfert 1 galaxies can be fitted well by a blackbody model or by composites of power-law and blackbody models. For Seyfert 1 galaxies which fit a power-law, E(B-V) is small and in the range of optically selected Seyfert 1 galaxies. However, for Seyfert 1 galaxies fitting a blackbody model, the temperature increases as E(B-V) increases. This is strong observational evidence to support the evolutionary scenario from starbursts to optical QSOs/Seyfert 1s.

3. We also discuss the possible mechanism for strong FeII emission from the point of view of evolution of mergers to AGNs.