The Spitzer Space Telescope: New Views of the Cosmos
ASP Conference Series, Vol. 357, 2006
L. Armus and W.T. Reach

Optical-IR SEDs of SDSS Quasars in the *Spitzer* First Look Survey

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Abstract. We analyze the spectral energy distribution (SED) of SDSS-selected quasars in the *Spitzer* First Look Survey area. Optical+IR colors allow for efficient selection of quasars. We construct a mean quasar SED that can be used to learn about accretion disks, disk-winds, and dusty tori. Future improvements in determining multiwavelength SEDs of different classes of quasars are needed to improve estimates of physical parameters of quasars such as bolometric luminosities and accretion rates.

1. SEDs and Quasar Physics

We explore the properties of Sloan Digital Sky Survey (SDSS; York et al. 2000) quasars and quasar candidates in the *Spitzer* First Look Survey area, including 50 SDSS-DR1 quasars and 140 photometric quasar candidates from Richards et al. (2004). It has been shown (e.g., Lacy et al. 2004) that *Spitzer* colors allow for relatively efficient and complete samples of AGNs (both obscured and unobscured). Here we demonstrate that unobscured quasars can be selected in an even more efficient manner by coupling *Spitzer* data with optical colors from the SDSS (Fig. 1). Black contours represent point sources, grey are extended sources (SDSS morphologies), and black crosses are known quasars. Even lacking morphology information, coupling SDSS and *Spitzer* photometry can be very effective in selecting quasar candidates.

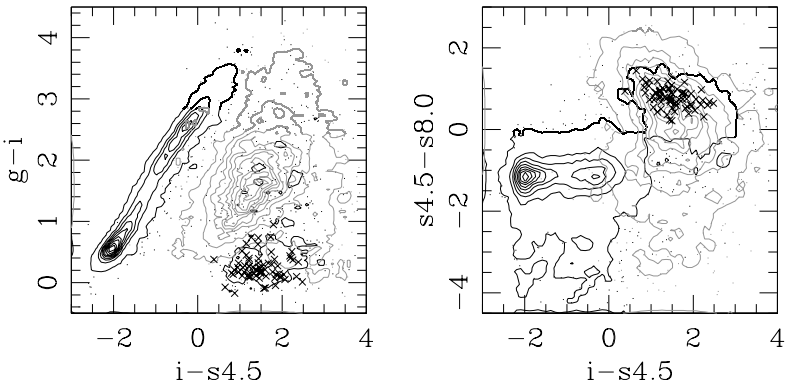

Figure 1. SDSS+*Spitzer* colors of quasars (black crosses), stars/point sources (black contours), and galaxies/extended sources (grey contours).

Accurate determination of quasar SEDs are crucial to our understanding of quasar physics. Comparison of the IR-Opt-UV SEDs of quasars can reveal the geometry of the IR dust emission (e.g., Nenkova, Ivezic, & Elitzur 2002). SEDs are also needed to determine bolometric luminosities and accretion rates, which are currently determined using a single mean quasar SED from Elvis et al. (1994). Future improvements in IR-Opt-UV SEDs in terms of filling in wavelength gaps and adding more objects (Fig. 2) will allow for SED determinations as a function of various properties: improving our ability to determine accurate bolometric luminosities and accretion rates.

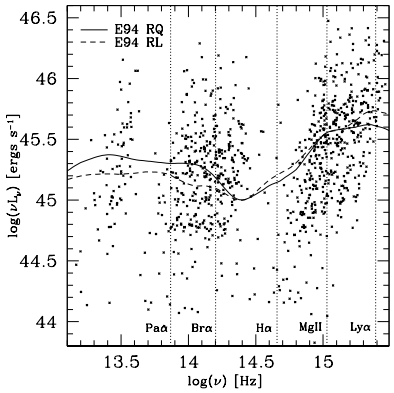

Figure 2. SDSS and *Spitzer* quasar photometry compared to the mean radio-quiet and radio-loud quasar SEDs from Elvis et al. (1994).

Acknowledgments. Funding for the SDSS archive has been provided by the Alfred P. Sloan Foundation, the Participating Institutions, NASA, NSF, the U.S. DoE, the Japanese Monbukagakusho, and the Max Planck Society. Based on archival data obtained with the Spitzer Space Telescope, which is operated by JPL/CalTech under NASA contract 1407. Support for this work was provided by NASA through Contract Number [1262694] issued by JPL/Caltech.

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