SEDs of Type 1 AGNs in COSMOS -- Evolution

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Quasar SED Evolution

Jiang et al., 2007, AJ, 134, 1150  NO EVOLUTION?

- Possible SED evolution with luminosity (Ho et al. 1999)
COSMOS Type 1 AGN Sample

- 324 type 1 AGNs XMM selection
- Magellan, SDSS, MMT, VLT optical spectra
- $z$ range: 0.1-4.3, most sources at 1-2
- $i_{AB}$ range: 16.9~23.5
- Good to study possible SED evolution
Luminosity and Redshift Bins
Mean SED in Luminosity Bins

- $46.5 < \log(L) < 47.8$
- $46.0 < \log(L) < 46.5$
- $45.6 < \log(L) < 46.0$
- $44.0 < \log(L) < 45.6$
Mean SED in Redshift Bins

- $2.01 < z < 4.25$
- $1.51 < z < 2.01$
- $1.12 < z < 1.51$
- $0.10 < z < 1.12$
PG & Point-like Sources
SED Example—Brightest $\log(L_{bol})=47.8$
Slope Plot (redshift bin 1 & 2)

$z=0.1-1.1$  
$z=1.2-1.5$

Slope in Infrared (7.5μm - 1μm)

Slope in Optical (1μm - 1200Å)
Slope Plot (redshift bin 3 & 4)

$z=1.5-2.0$

$z=2.0-4.0$

Slope in Infrared (7.5μm-1μm)

Slope in Optical (1μm - 1200Å)
Slope Plot (luminosity bin 1 & 2)

L = 44.1 - 45.6

Slope in Infrared (7.5 μm - 1 μm)

Slope in Optical (1 μm - 1200 Å)

Ell5, S0, Starburst, E94
Slope Plot (luminosity bin 3 & 4)

L=46.0-46.5

L=46.5-47.8

Slope in Infrared (7.5μm-1μm)

Slope in Optical (1μm - 1200Å)
Galaxy Fraction

Histogram of the Fraction of S0 Galaxy

Histogram of the Fraction of Elliptical Galaxy (5 Gyr)
Galaxy Fraction Evolution

Galaxy(Ell 5) Fraction in z bins

- 2.0–4.3
- 1.5–2.0
- 1.1–1.5
- 0.1–1.1

Galaxy(Ell 5) Fraction in Lbol bins

- 46.5–47.8
- 46.0–46.5
- 45.6–46.0
- 44.1–45.6
Blackbody T of IR Bump

Histogram of BB Temperature of the IR bump
Blackbody T of IR Evolution

*T of the IR bump in z bins*

*T of the IR bump in Lbol bins*
Results

- AGN+Galaxy+Extinction
  - Could explain low redshift sources
  - Not good for high redshift sources!!

- Interesting SED evolution with z and L !?!
  (still under investigation)
Future Work: Short Term

- SED improvements:
  - Host galaxy contamination correction:
    1. $z<1$ HST imaging to separate nuclear and host light
    2. $z>1$ Multicomponent (Galaxy+AGN) SED fitting

- SED from different selection methods
  Select different sub samples that satisfy different selection criteria and compare SED shape difference

- Correlate continuum shape with physical parameters: $L_{\text{bol}}$, $M$, ...

- PCA analysis
Future Work: Long Term

- Model extreme objects, variables
- Reddening curves vs. z,L

- C.f. Spitzer-, submm-, Chandra-selected AGNs:
  - approach bolometric selection
  - extend luminosity range