Coeval Star Formation and Black Hole Growth in the Most Massive Galaxies

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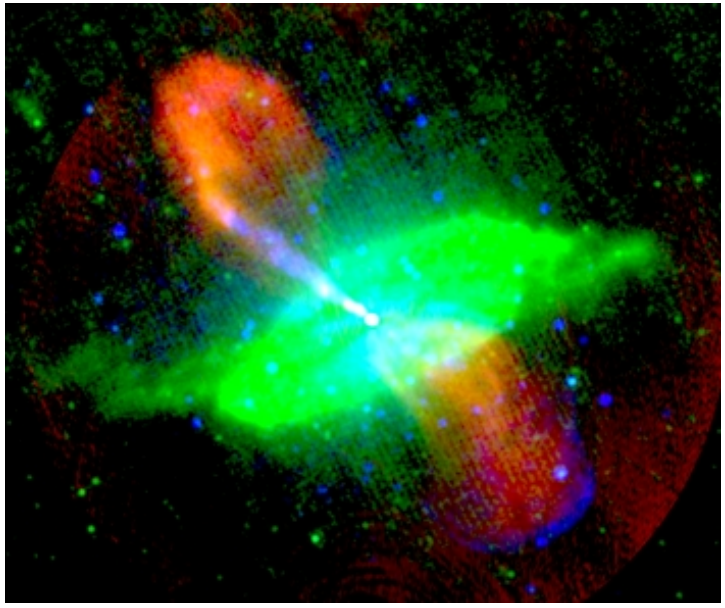
High Redshift Radio Galaxies (HzRGs)

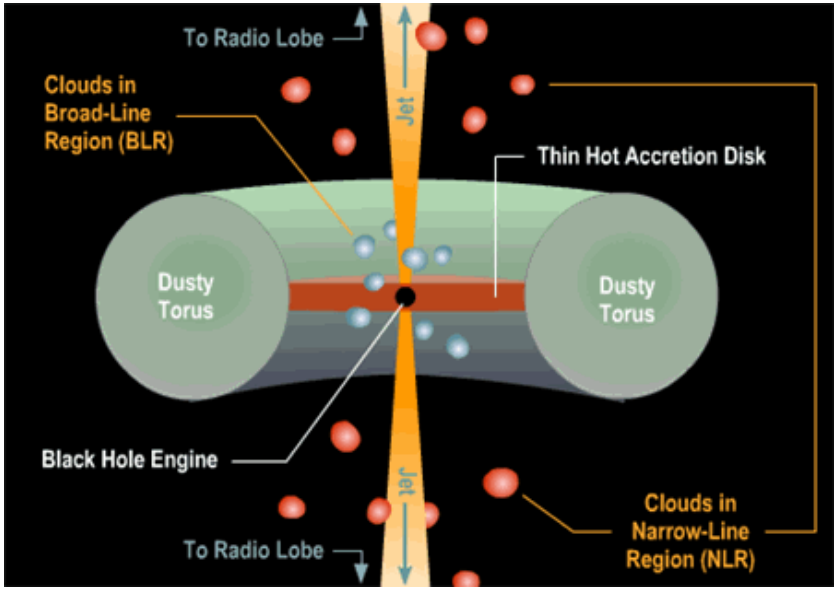
- Mostly hosted by elliptical galaxies
- Among most massive galaxies in Universe
- Contain a dust obscured radio-loud type II AGN and emit radio jets
- High accretion rates
- Host massive black holes due to bulge/black hole mass relation
- Rare objects as radio jets and star formation have very short periods (<0.1Gyr)



Hardcastle, 2006

Aims

- Using Spitzer-IRS MIR data to perform spectroscopy on high redshift radio galaxies (HzRGs)
- Looking for PAH emission and silicate absorption features



U. Of Florida website

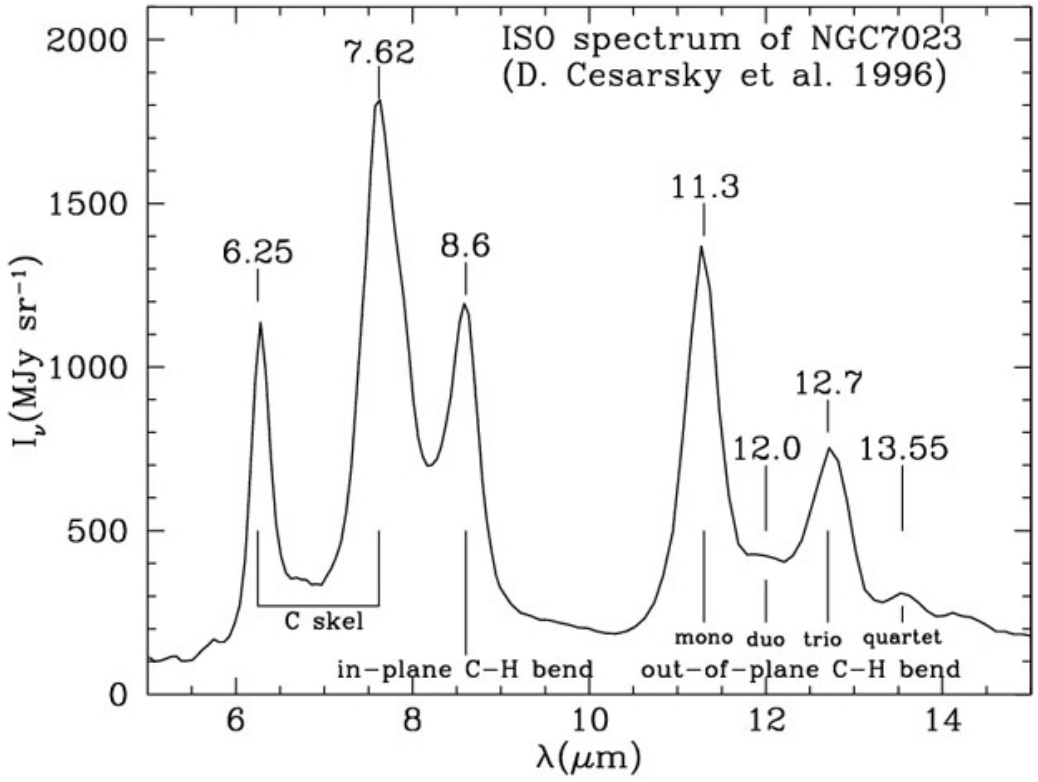
- To measure star-formation rates (SFR) and find out how compact the obscuring dust is around AGN

Motivation

- Find the link between star formation and AGN activity
- And see if central black hole and host galaxy grow coevally- probing their formation and evolution
- Silicate absorption (at 9-10μm) can tell us about dust distribution and may indicate dusty starbursts
- Rest-frame mid-IR luminosities will lead to a measure of the accretion rates in these AGN

Polycyclic Aromatic Hydrocarbons (PAHs)

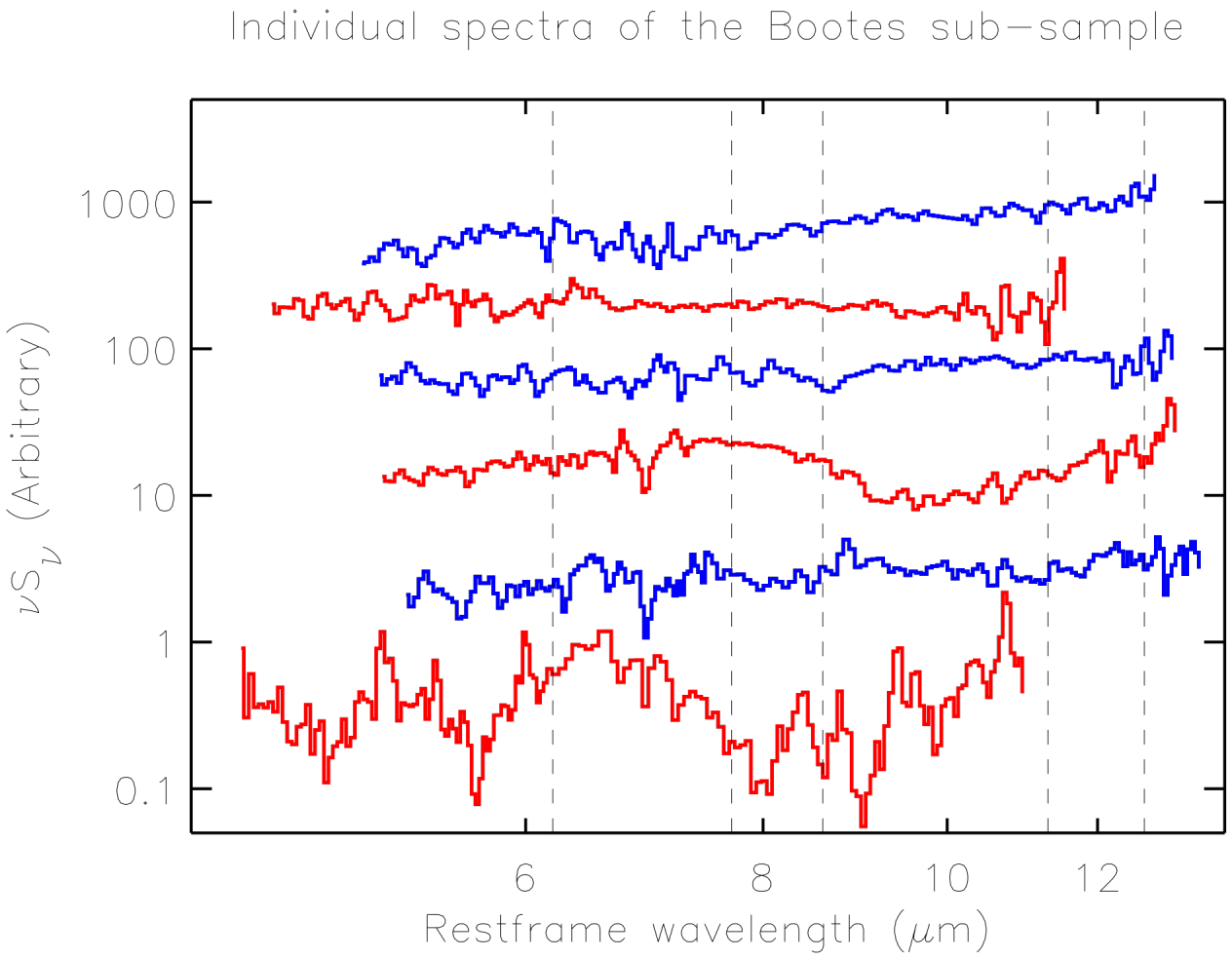
- PAHs are an approximate indicator of galaxy SFRs

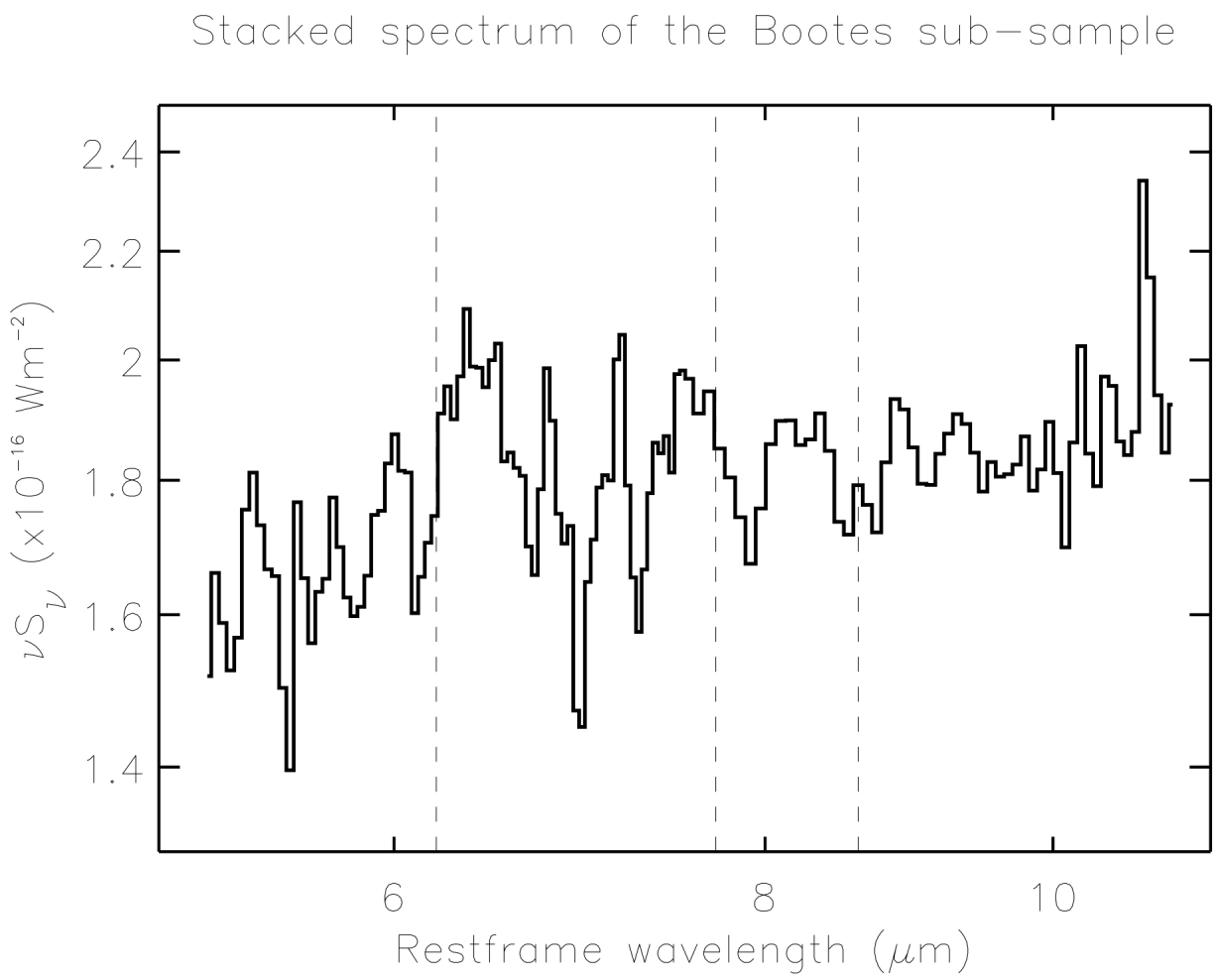


Three data sub-samples:

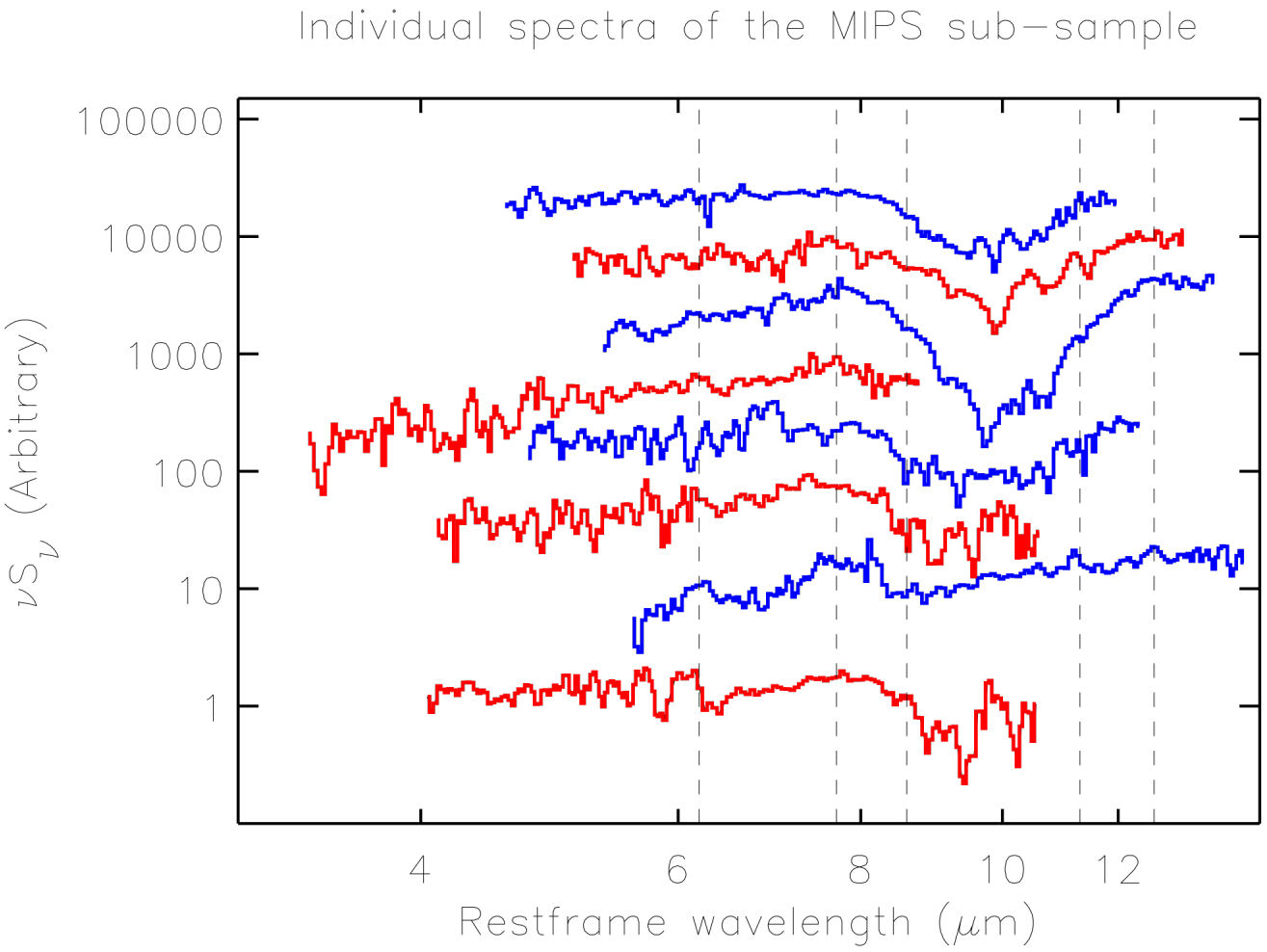
- High luminosity radio galaxies from All-sky surveys
- Lower luminosity radio galaxies from Boötes Field
- Radio luminous MIPS sources from First Look Field

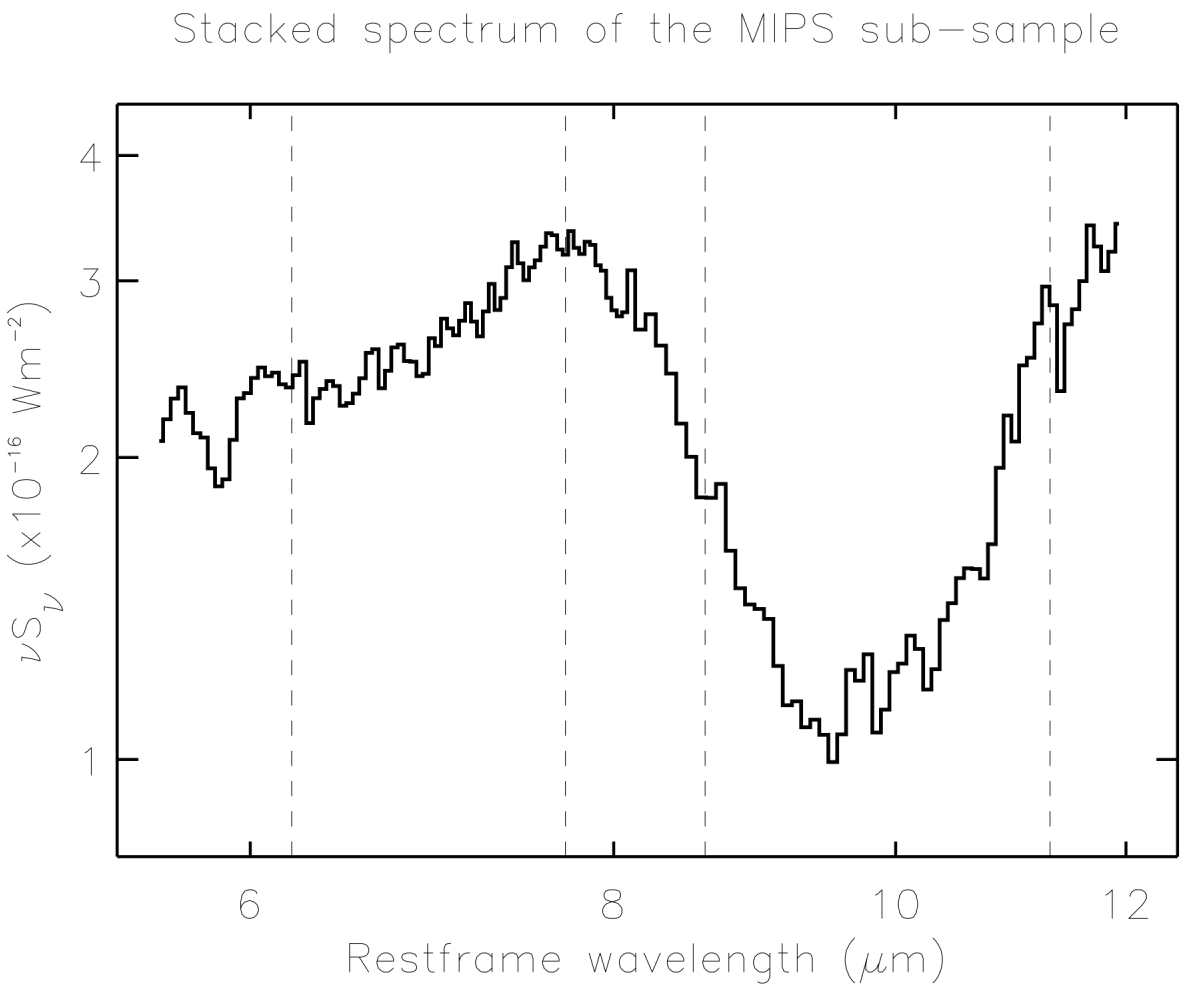
Spectral Results



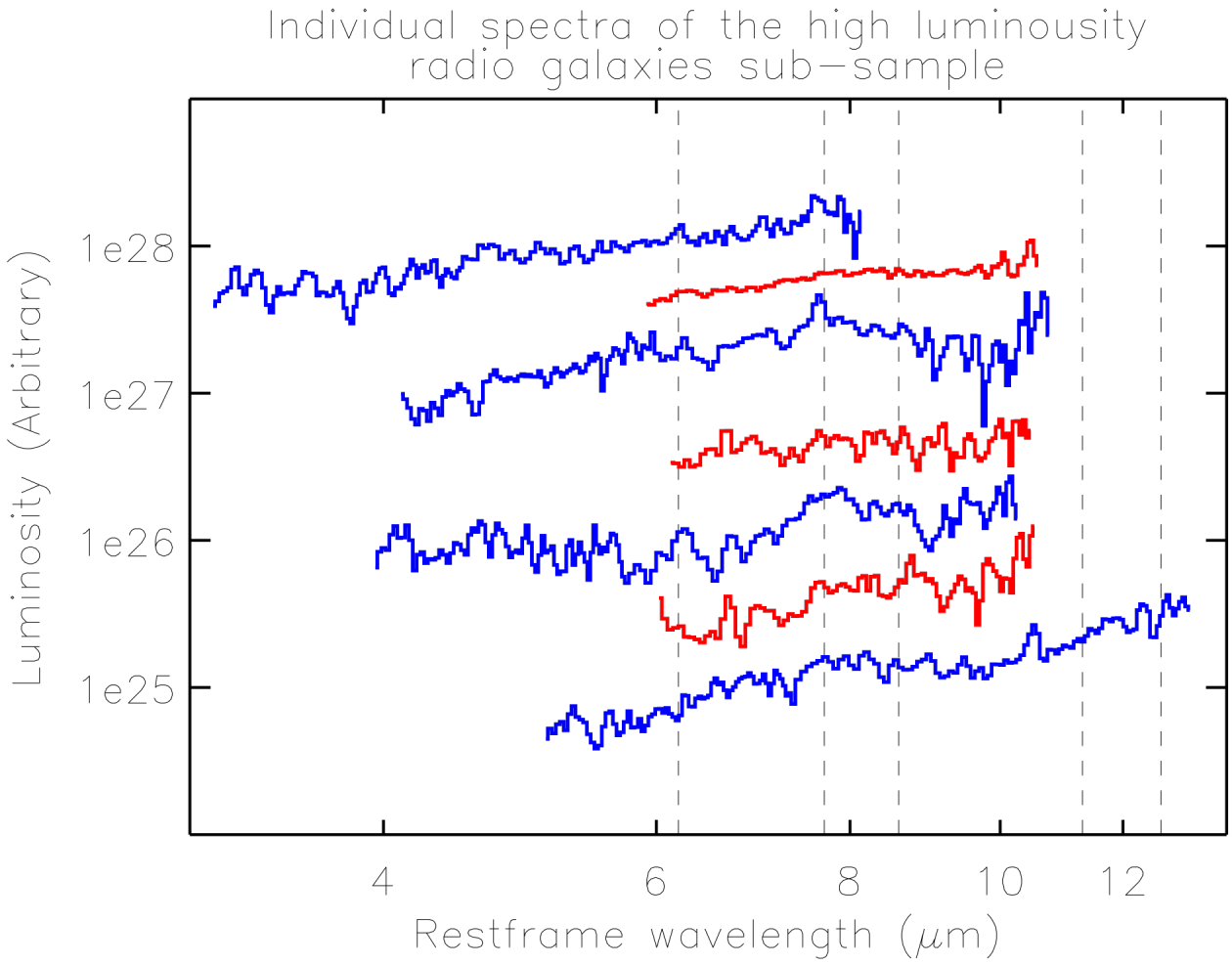

Stacked spectrum of the Bootes sub−sample
2.4
2.2
2
1.8
1.6
1.4
νS_ν ($\times 10^{-16}$ Wm^{-2})
6
8
10
Restframe wavelength (μm)

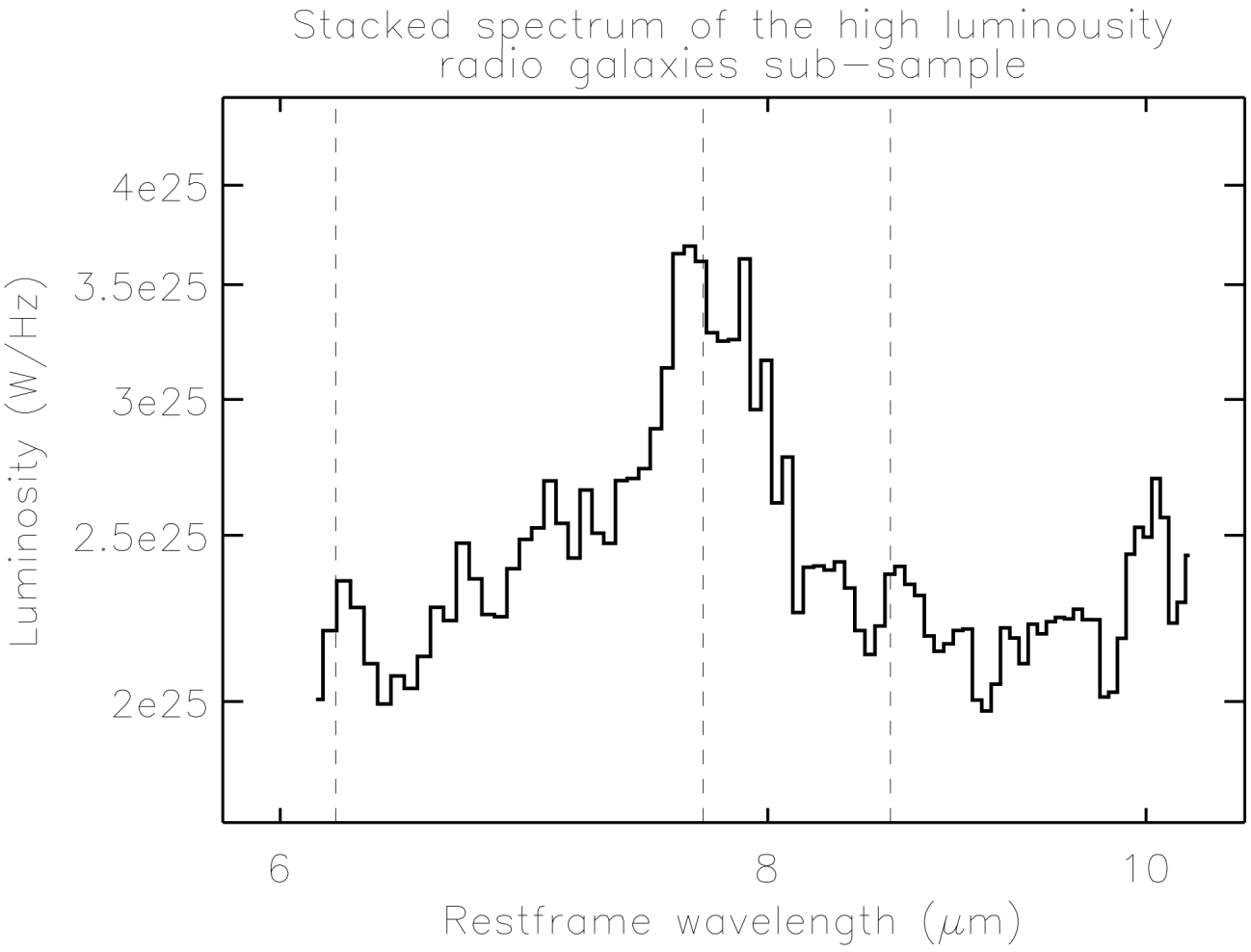
…deep silicate absorption




Stacked spectrum of the MIPS sub−sample
4
3
2
1
νS_ν ($\times 10^{-16}$ Wm^{-2})
6
8
10
12
Restframe wavelength (μm)

...PAH emission




Stacked spectrum of the high luminousity
radio galaxies sub−sample
Luminosity (W/Hz)
4e25
3.5e25
3e25
2.5e25
2e25
6
8
10
Restframe wavelength (μm)

Preliminary results

- PAH emission and silicate absorption detected in high luminosity galaxies
- Deep silicate absorption detected in MIPS sources
- No apparent detections in the Bootes field
- Further analysis still to be done:
  - Spectral Energy Distribution (SED) fitting