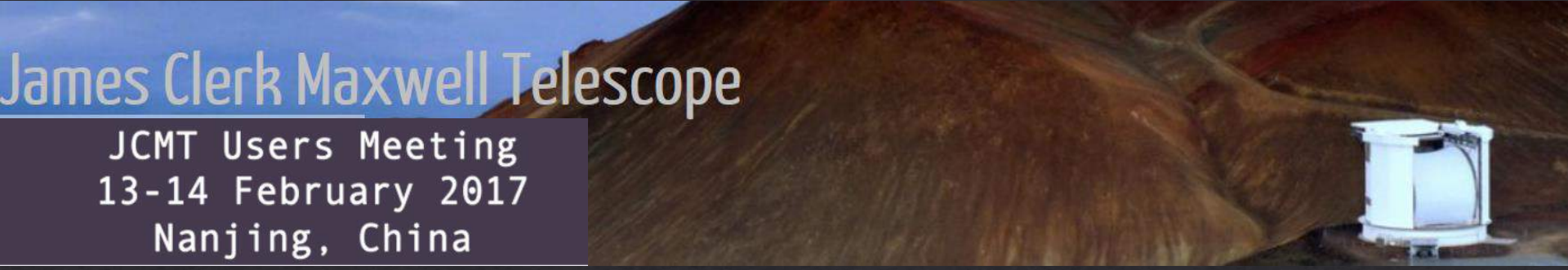

JCMT SCUBA-2 follow-up of hot dust-obscured galaxies

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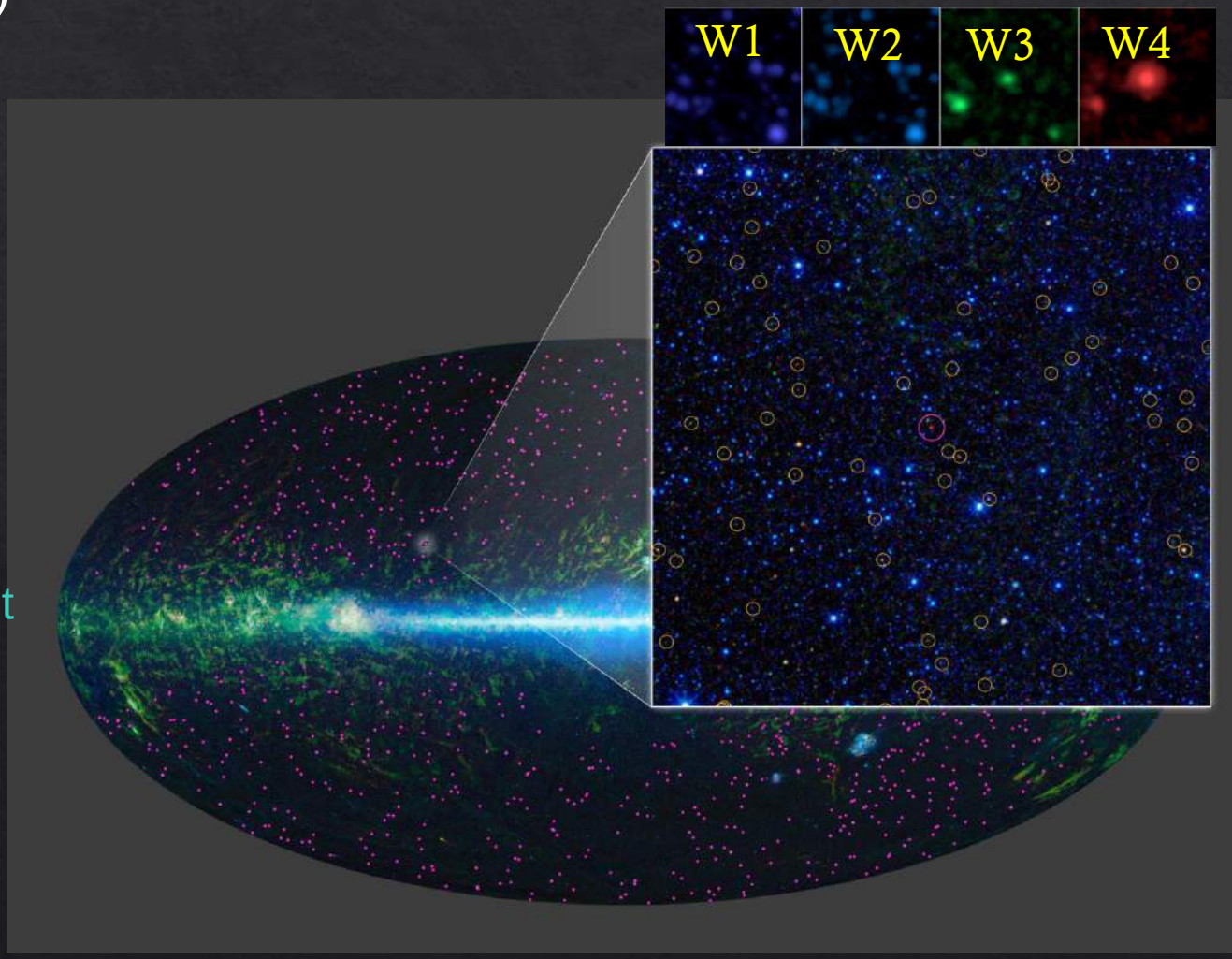
A new population of hyperluminous, dust-obscured galaxies

W1W2-dropout selection
(Eisenhardt et al. 2012)

- ✧ Faint @W1/W2;
  Bright @ W3/W4;

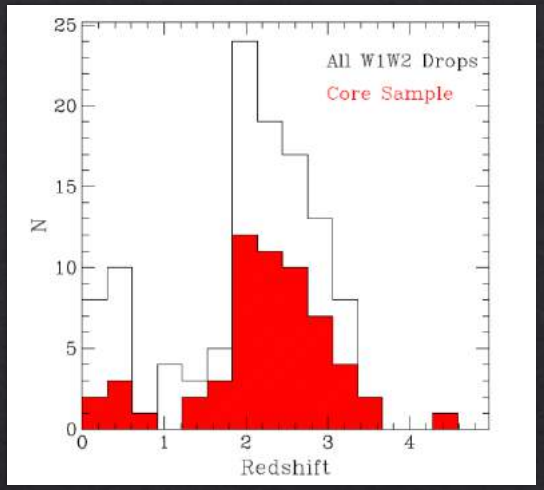
At z~2-3

- ✧ W3/W4 trace AGN- or SB-heated hot dust,
- ✧ W1/W2 sample the rest NIR obscuration.

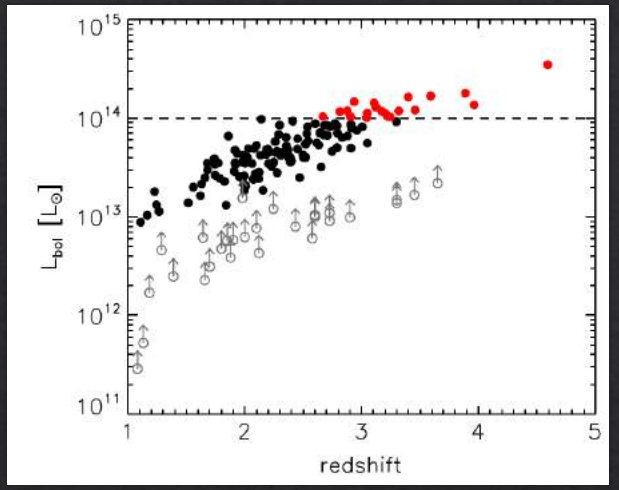


Publications and revealed properties

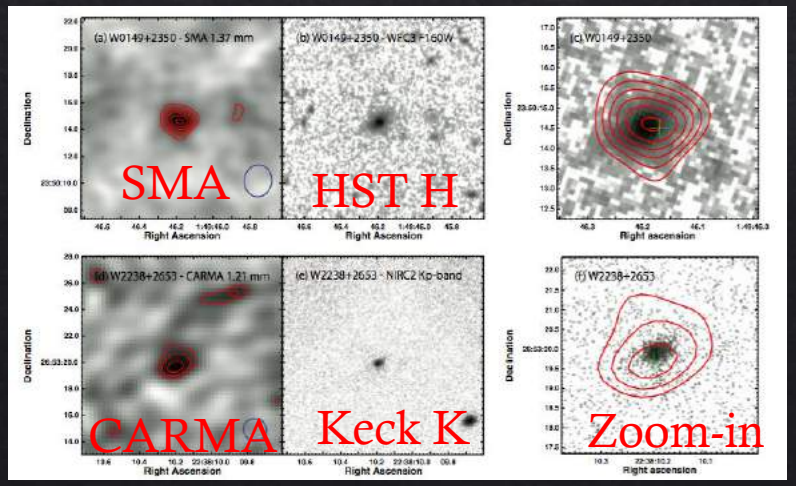
Eisenhardt et al. 2012
Tsai et al. 2015;
Assef et al. 2015;
Wu et al. 2012,2014; 2016
Jones et al. 2014;
Stern et al. 2014;
Piconcelli et al. 2015;
Diaz-Santos et al. 2015;

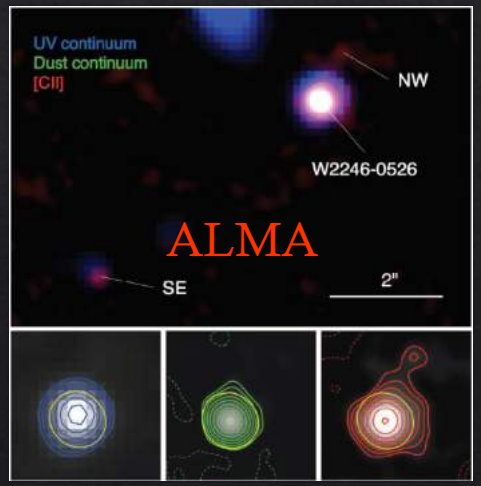


high-z



high-luminosity

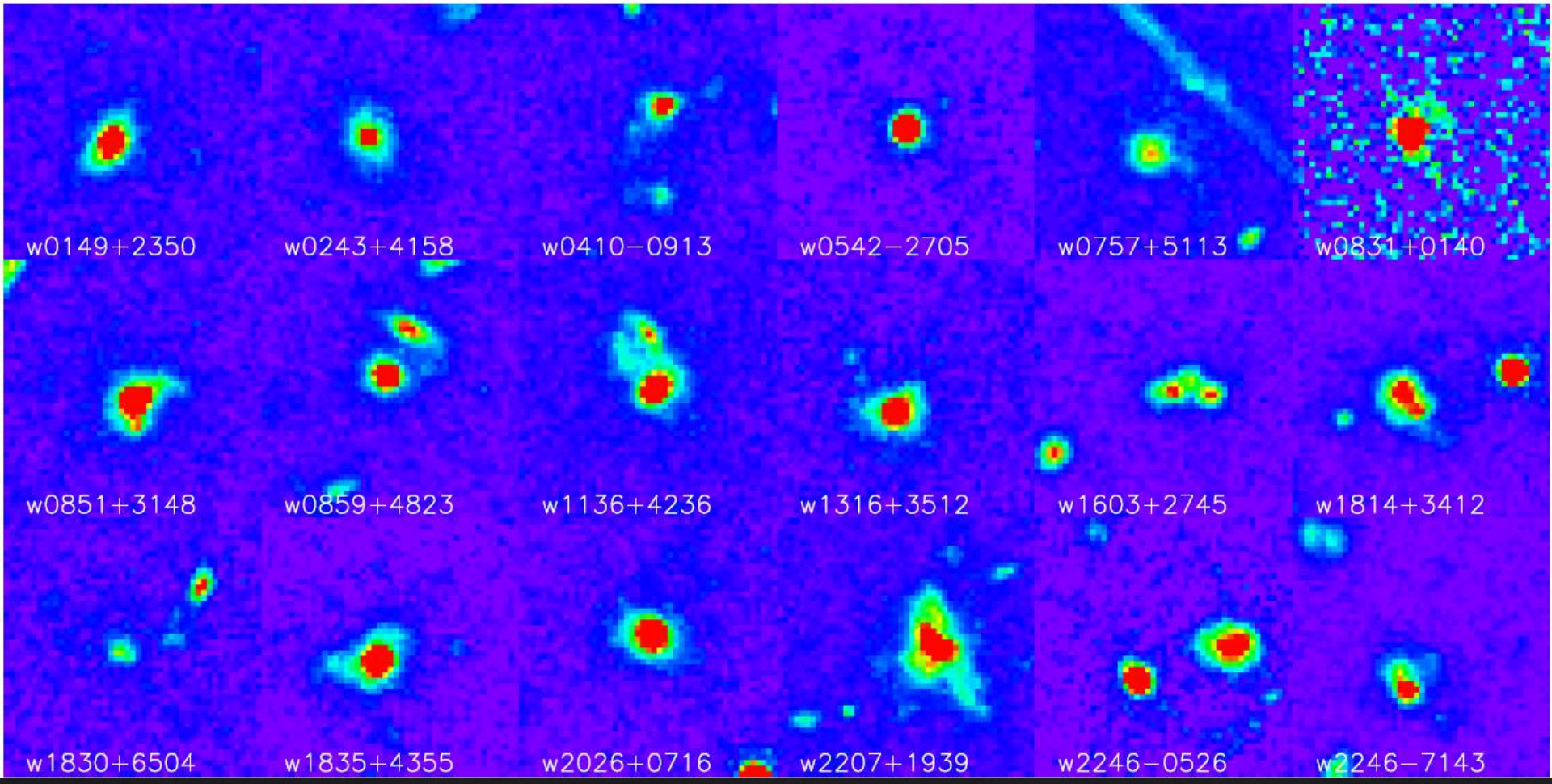




No lensing
No beaming
Intrinsically luminous

Visual classification of Hot DOGs morphology

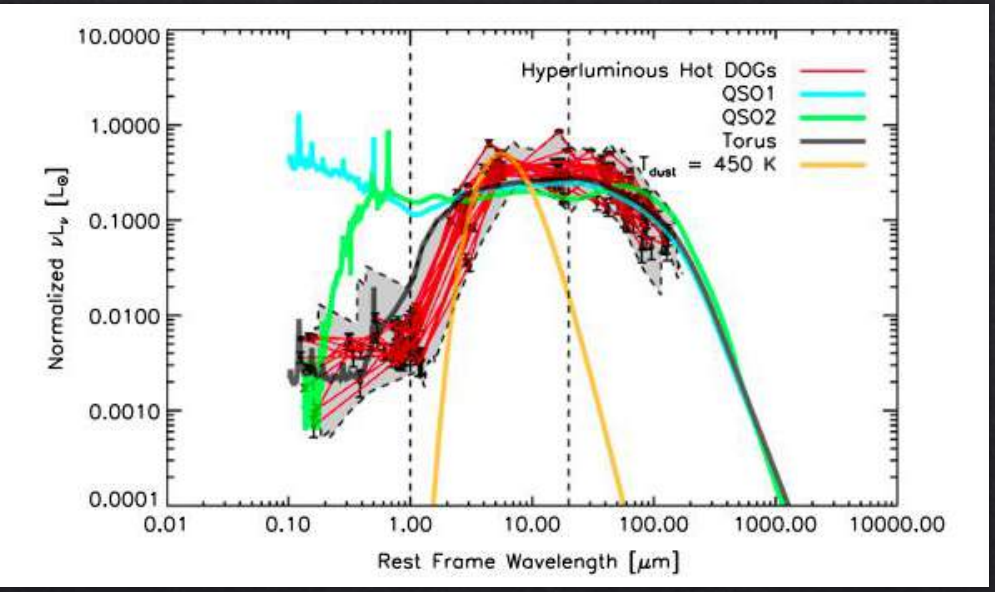
a high merger fraction



Fan et al. 2016a

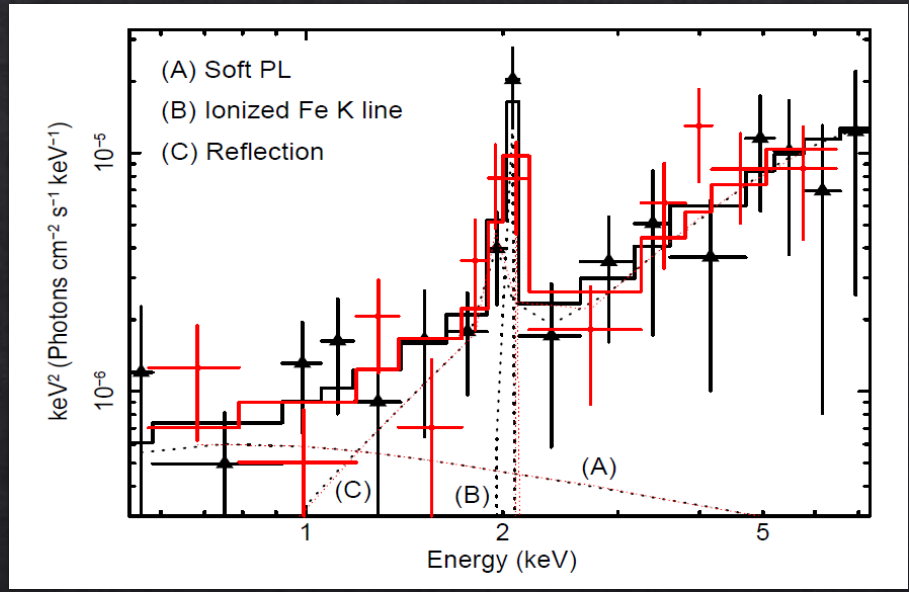
Infrared spectral energy distributions and central engine

IR SED



MIR-dominated (hot dust)

X-ray spectrum



heavily-obscured, Compton-thick AGN

Hot Dust-Obscured Galaxies (Hot DOGs)

Central engine: buried AGNs

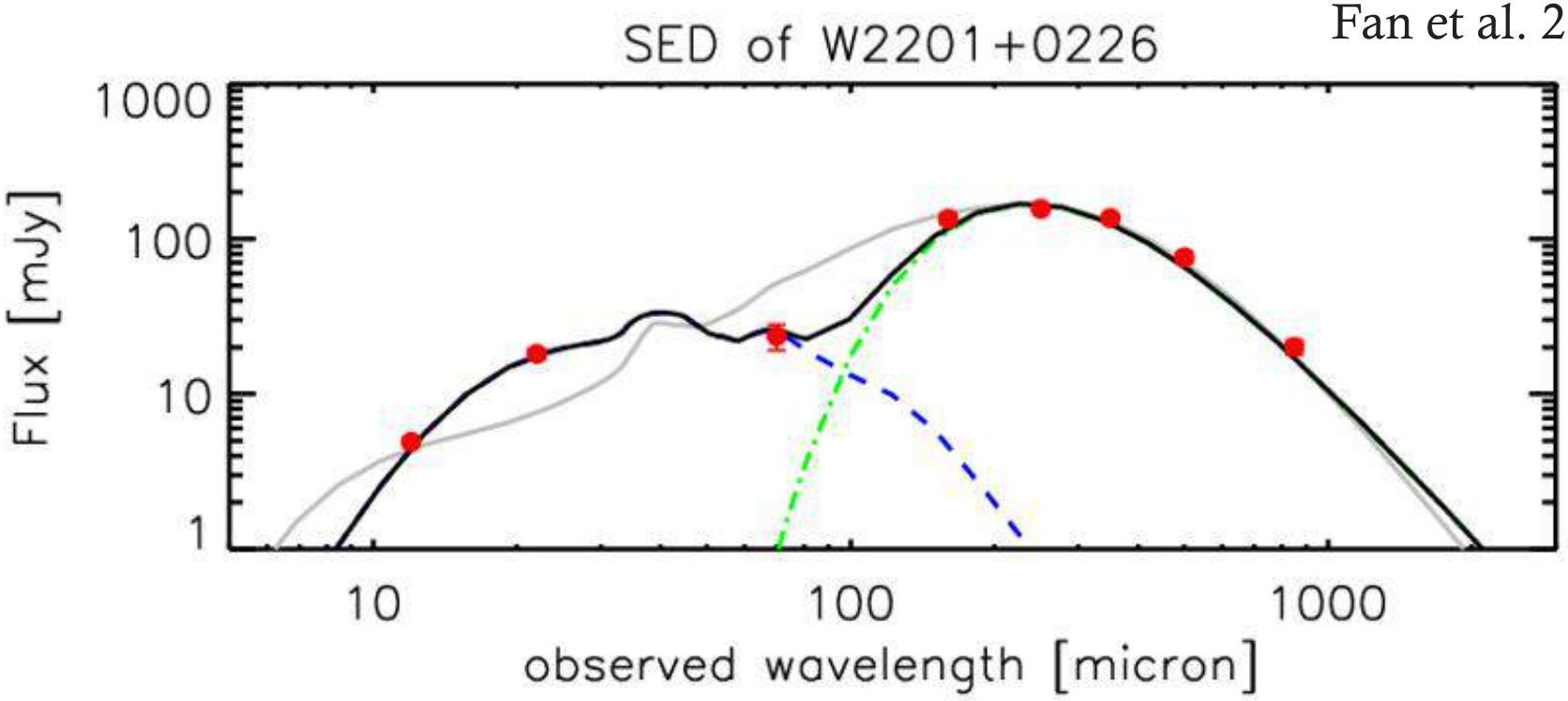
SCUBA-2 follow-up of Hot DOGs

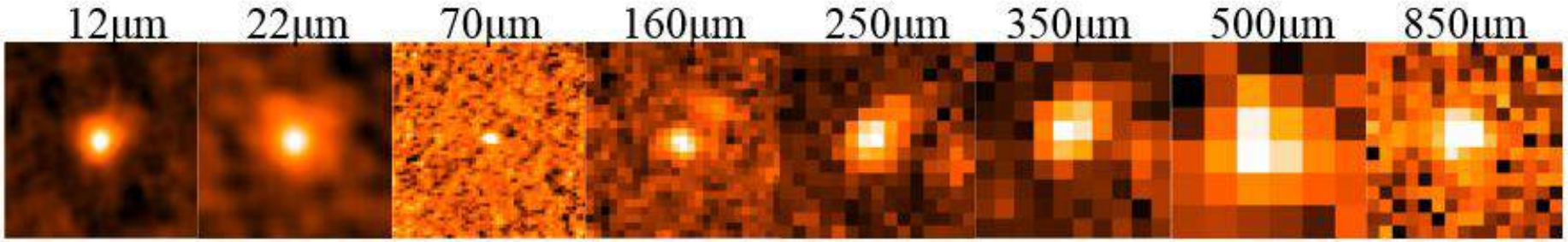
- 15A and 15B semesters (July 2016 completed)
- ~38hrs allocated; ~20hrs observed
- 10 Hot DOGs, each with 2hrs obs, ‘CV DAISY’ mode
- Redshift range: 2.0-3.7
- The optical depth at 225 Ghz: 0.08<tau<0.12 (band 3)
- 850um rms: 2.1-3.1 mJy
- 4/10 detected at >3σ

Detailed IR SED decomposition

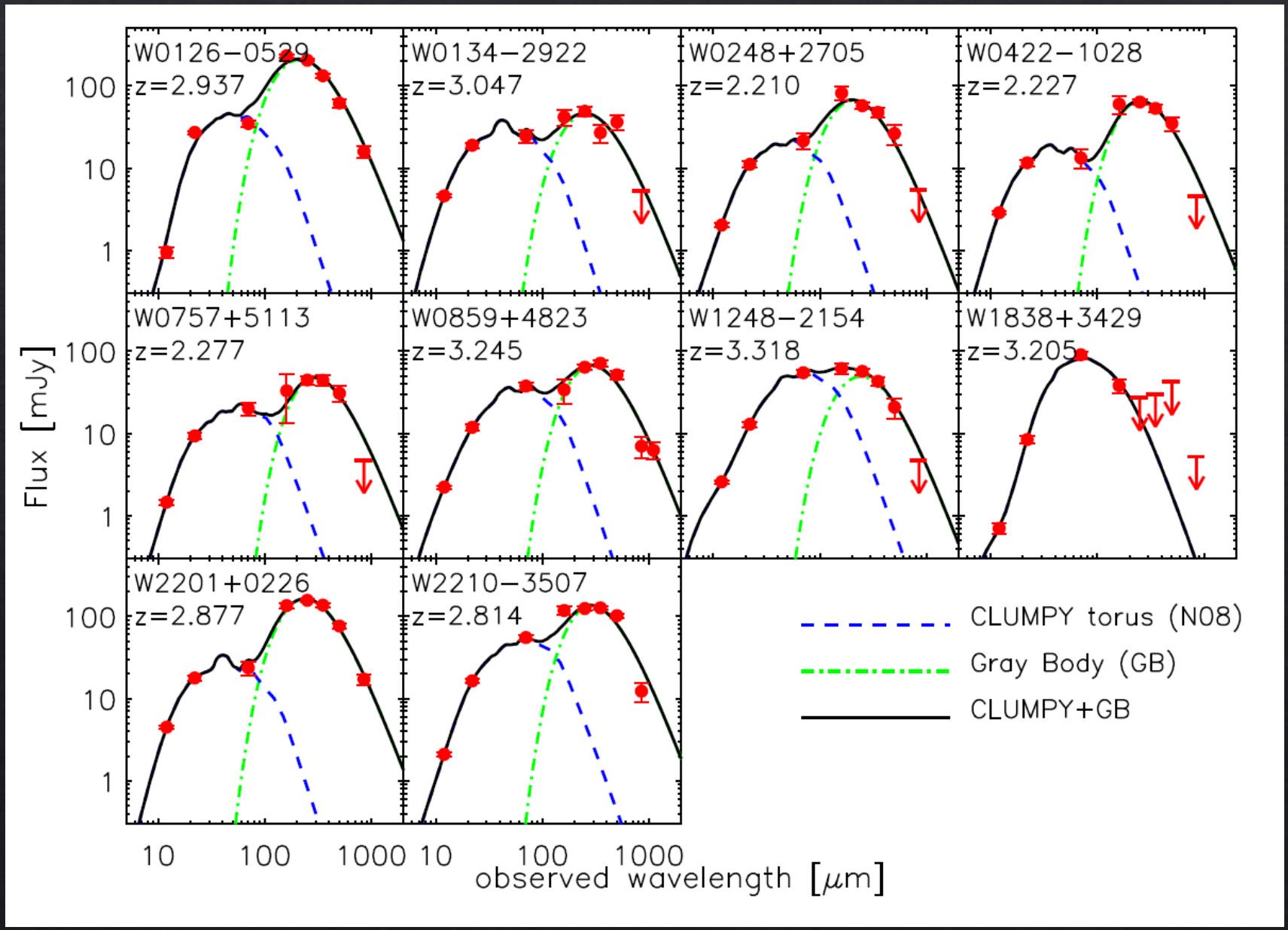
Torus model (blue)+ Gray body (green)

Fan et al. 2016b

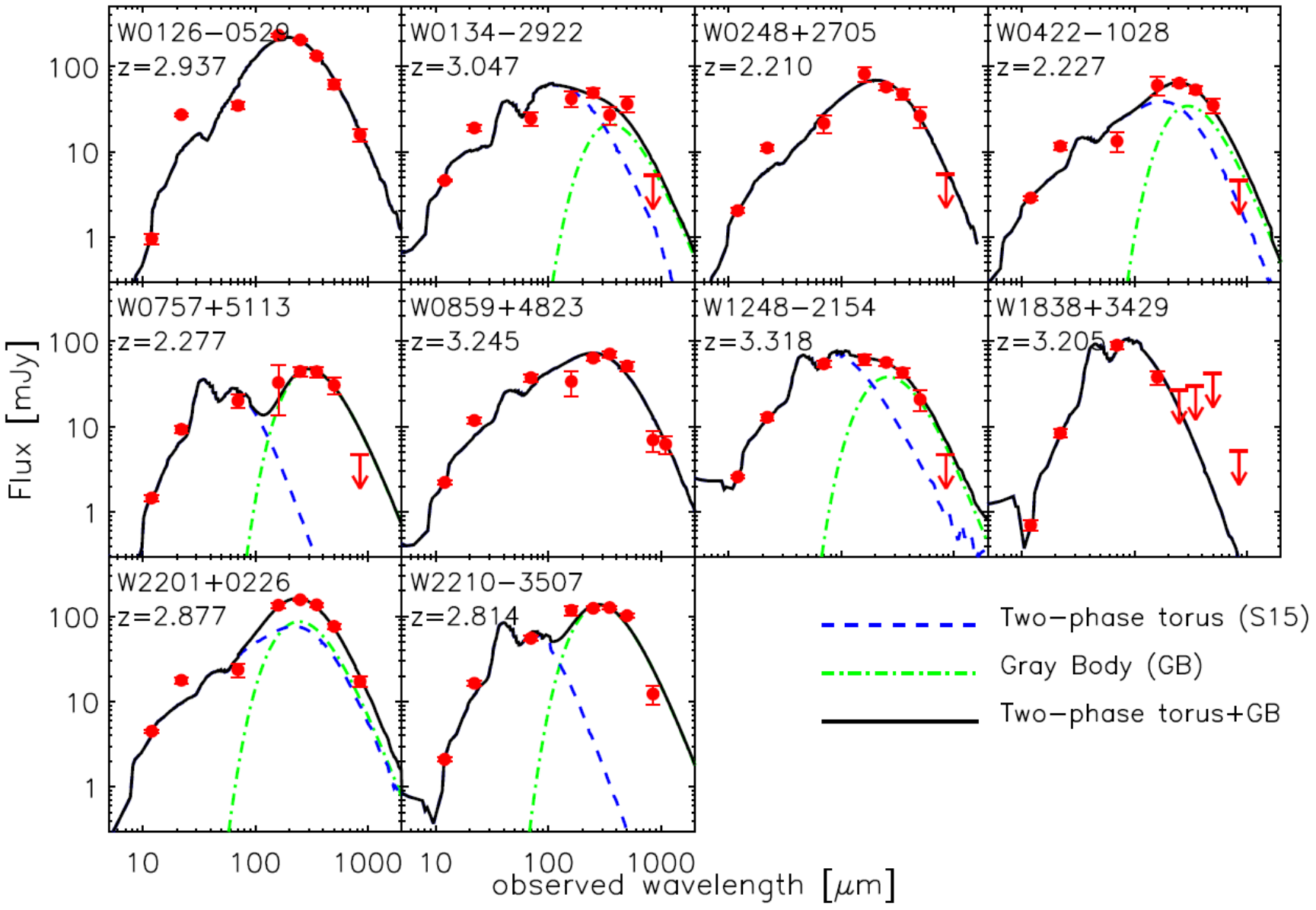


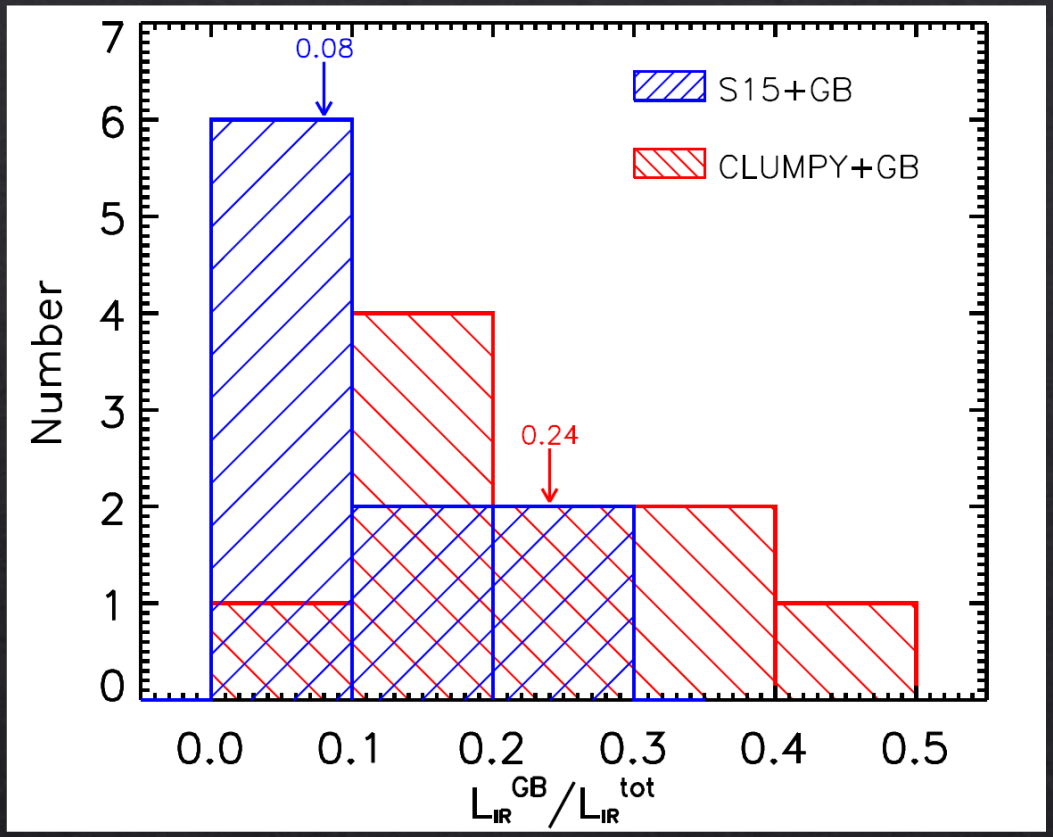


Constrain the cold dust emission



Constrain the cold dust emission

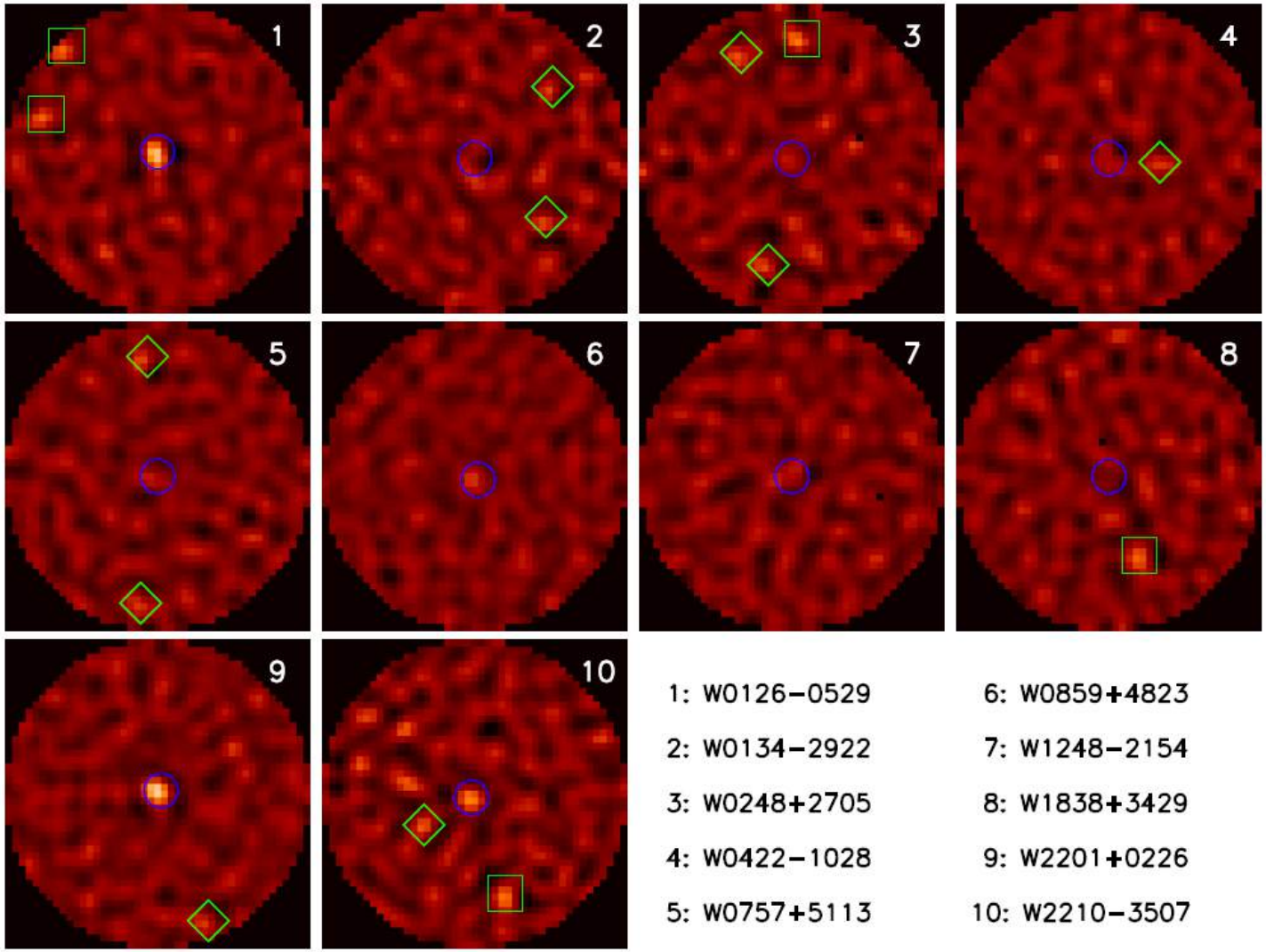




Cold dust emission only contributes a small portion of total IR luminosity.

AGN torus emission dominates!

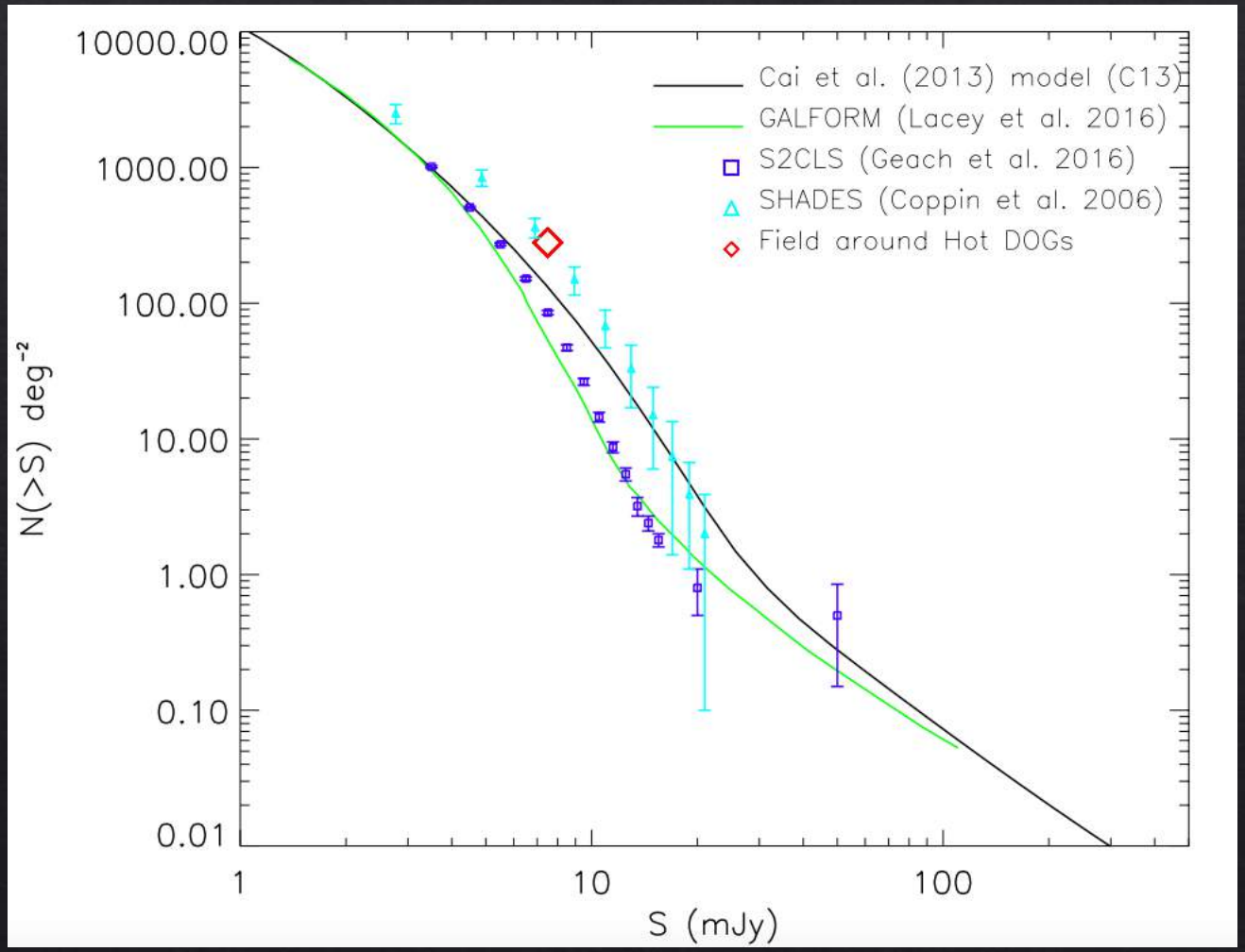
serendipitous sources in the 1.5-arcmin-radius SCUBA2 map



>3σ: 14 (diamonds)

>3.5σ: 5 (squares)

Cumulative number counts of SMGs around Hot DOGs



1-4 times larger compared to other surveys and models

As a comparison, radio-selected Hot DOGs: 10-30 times larger (Silva et al. 2015)

Summary

- SCUBA-2 850um photometry of 10 Hot DOGs shows a 40% detection rate.
- We try to constrain the cold dust emission in Hot DOGs by using SED decomposition. We find that the cold dust emission only contribute a small portion.
- We search the serendipitous sources around Hot DOGs in the 1.5-arcmin-radius map and find 14/5 sources at >3.0σ/3.5σ,respectively.
- Cumulative number count of SMGs around Hot DOGs only show a moderate overdensity, compared to those around radio-selected Hot DOGs.