(2021.6.11)

Surveys of SFG

telescope	D	FoV	素子数	感度	deg^2	N
ATT12	12m	1.2°	900×7@460 3000×7@850	1.6mJy@400(5σ,CL) 0.83mJy@850(5σ,CL)	**南天全体 20626**	
Harschel	3.5m		43@600 88@860 139@1200	51mJy@600(5σ) 47mJy@860 37mJy@1200	570 (→1270)	
ACT Atacama Cosmology Telescope	6m		@148 @218 @277	 10mJy@218(5σ) 10-20mJy@277	840	
SPT South pole Telescope	10m	1°	960@95+ @150+@220	9.8mJy@95(4.5σ) 5.8mJy@150 20.4mJy@220	2530	~5000
APEX	12m		@350	4.4mJy@350(3.7σ)	0.25	~800
JCMT	15m		@350	4.2mJy@350(3.5σ)	5	~3000

SPT

Everett+2020

The Astrophysical Journal, 900:55 (33pp), 2020 September 1

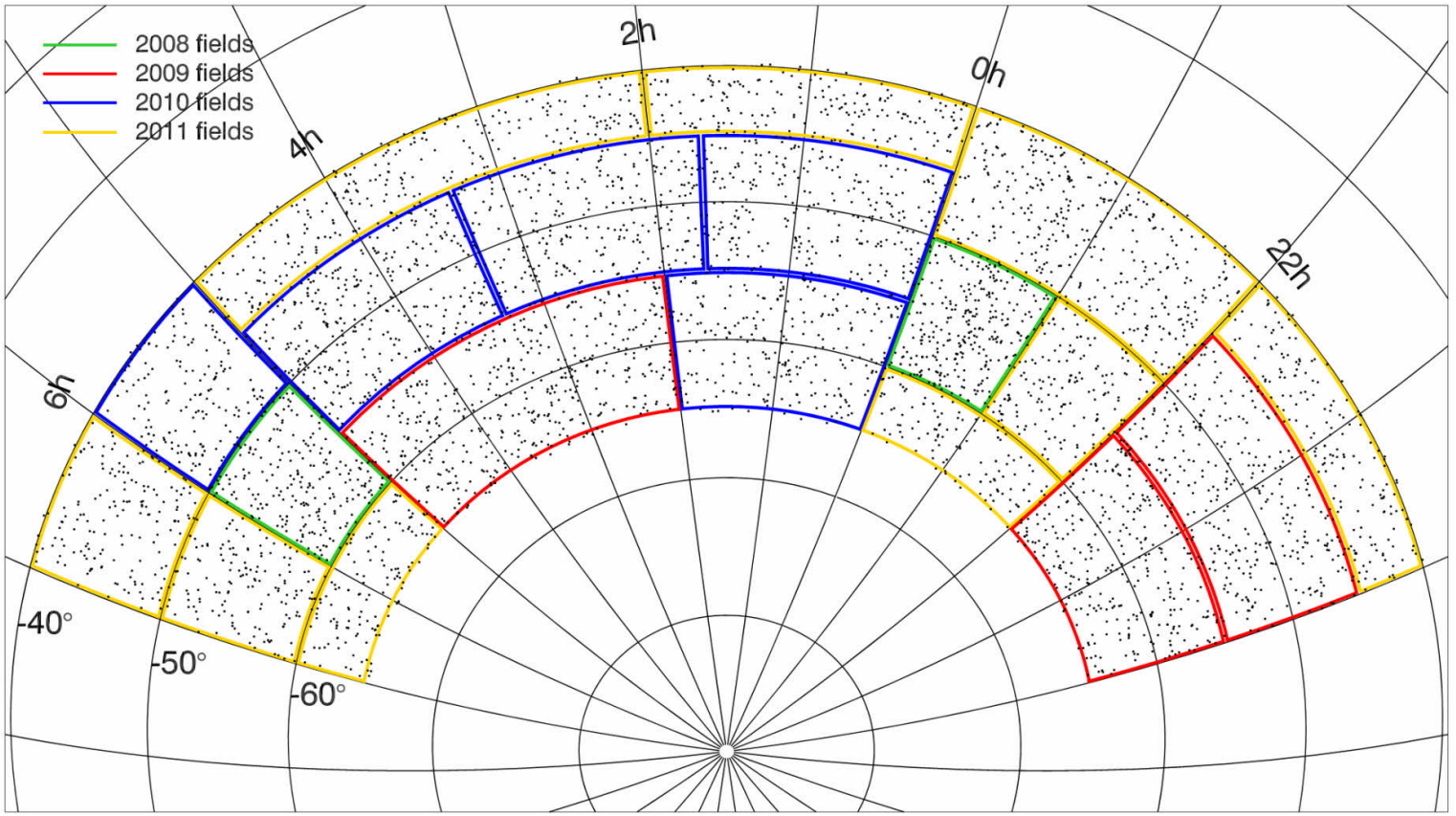


Figure 1. The 2500 square degree SPT-SZ survey was observed in 19 separate fields shown in outlines. Field outlines are only illustrative of field locations and areas and are not the masks used in the analysis. The two fields observed in 2008 were re-observed in 2010 and 2011, which is not indicated in this figure. Black dots indicate the locations of all sources reported in the catalog of this work.

2530 deg^2

SPT

Sample selection: >20mJy@220GHz
(4.5σ)

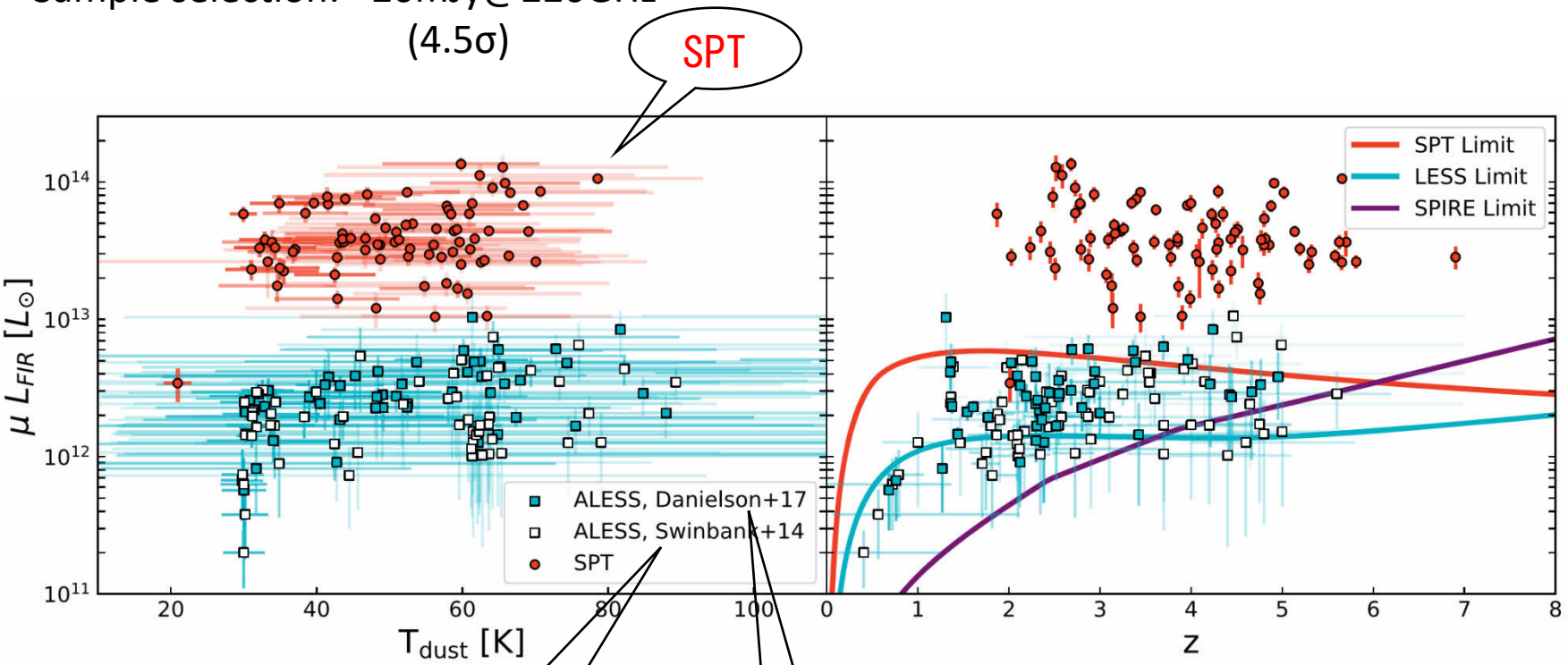


Figure 8. Left: apparent L_{FIR} vs. T_{dust} for the unlensed ALESS sources (teal) presented in Swinbank et al. (2014), Danielson et al. (2017) and the lensed SPT sources

Harshel+ALMA

APEX+ALMA

SPT

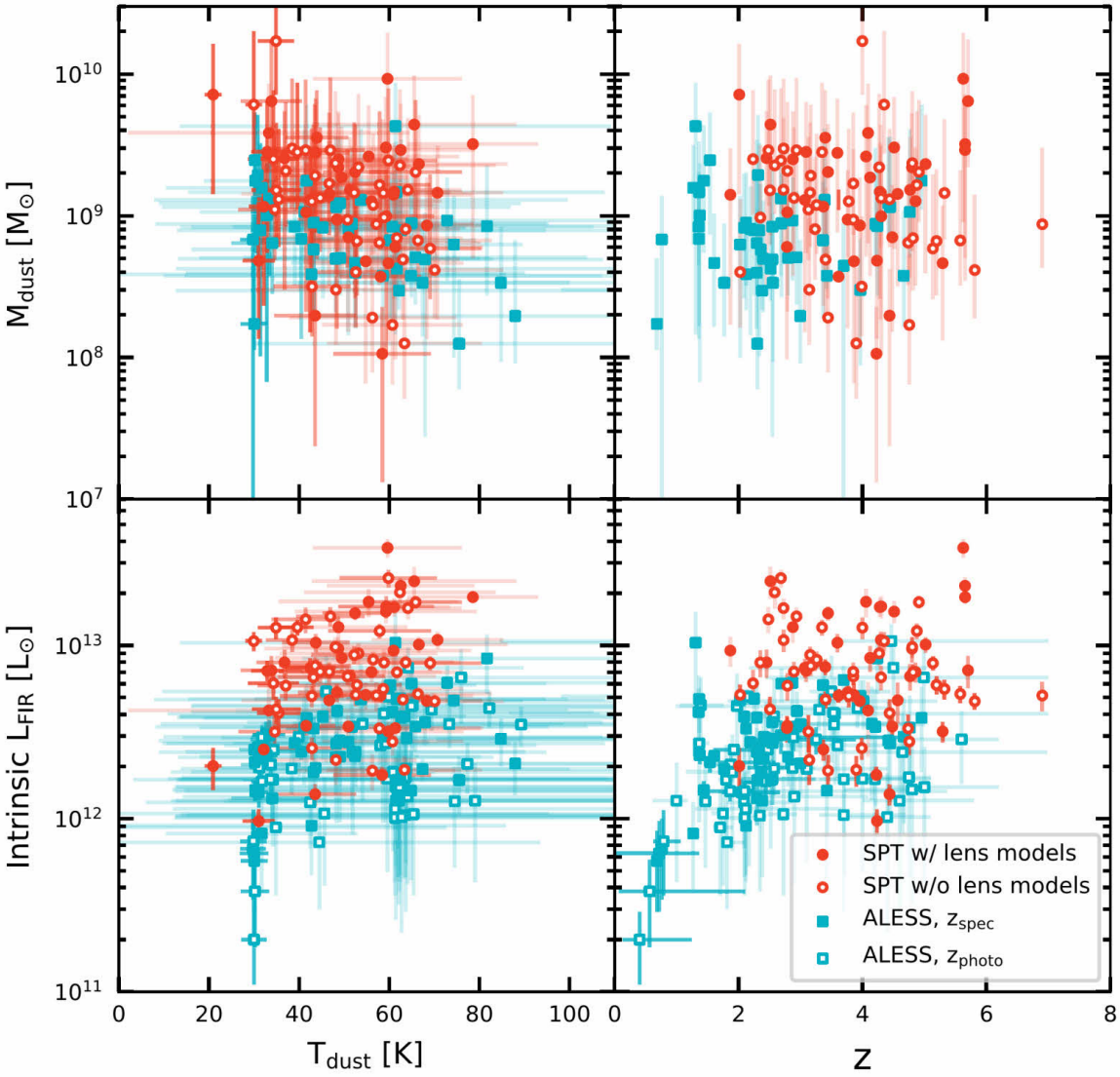


Figure 9. Derived intrinsic source properties for the SPT sample, compared with the ALESS sample. Top rows: dust mass (M_{dust}) as a function of T_{dust} (left) and

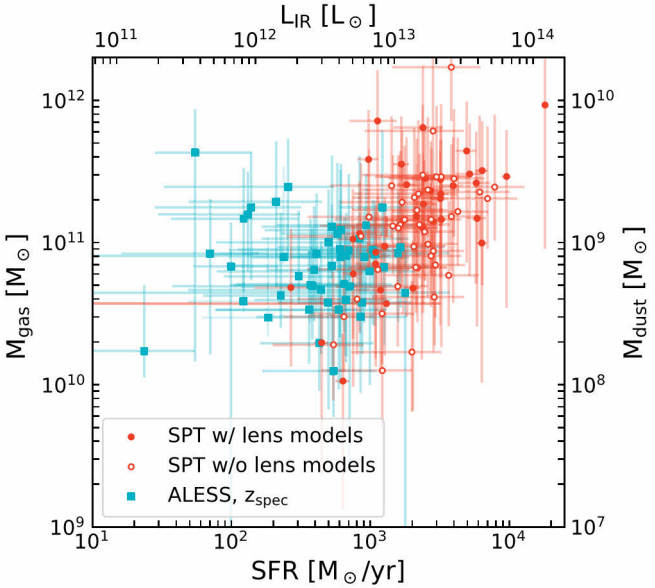


Figure 12. Gas mass vs. SFR for the demagnified SPT-selected sources and the

SPT

SPT-DSFG のみ

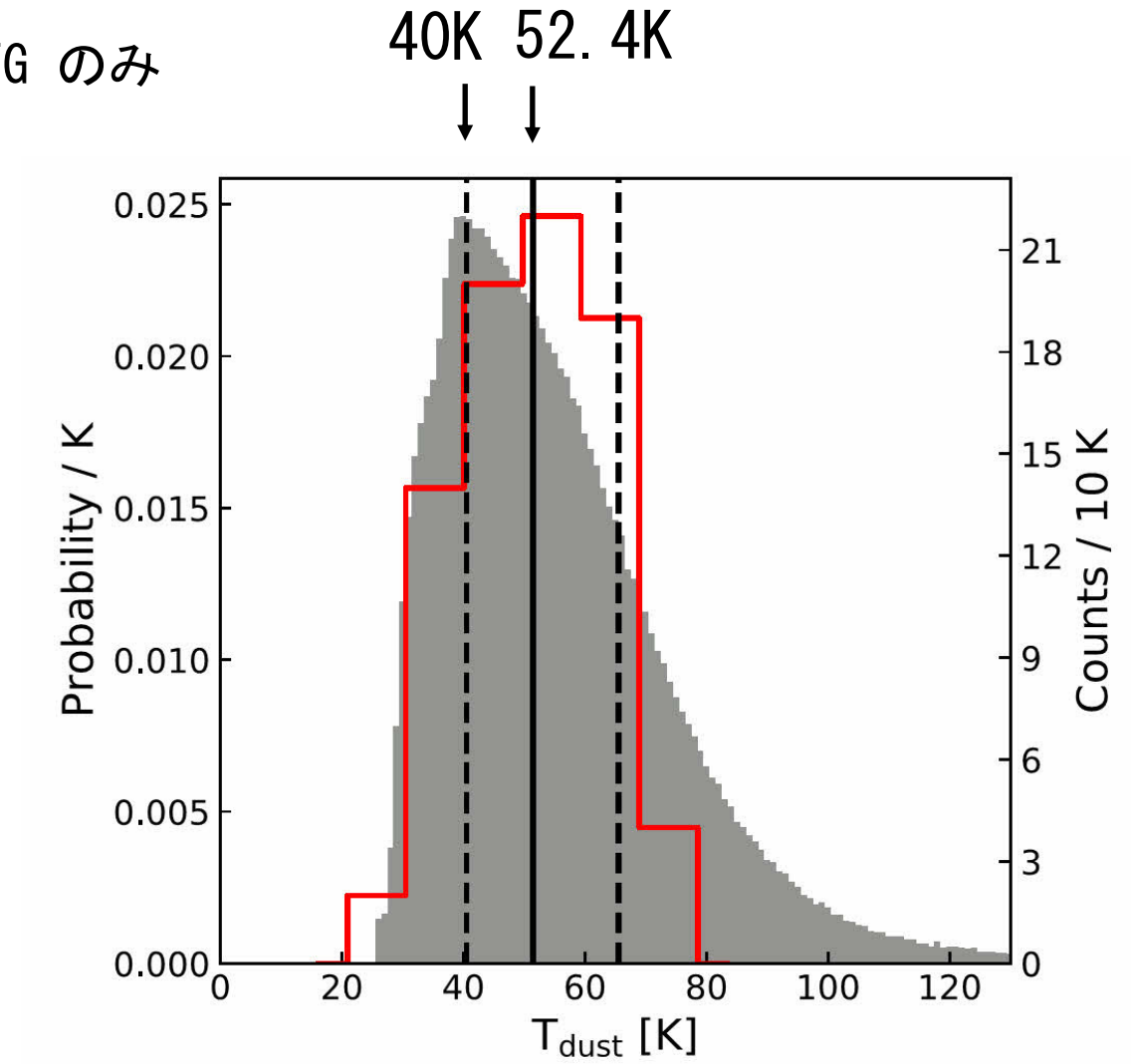


Figure 5. The probability distribution of the dust temperature for all sources in

SPT

SPT-DSFG のみ

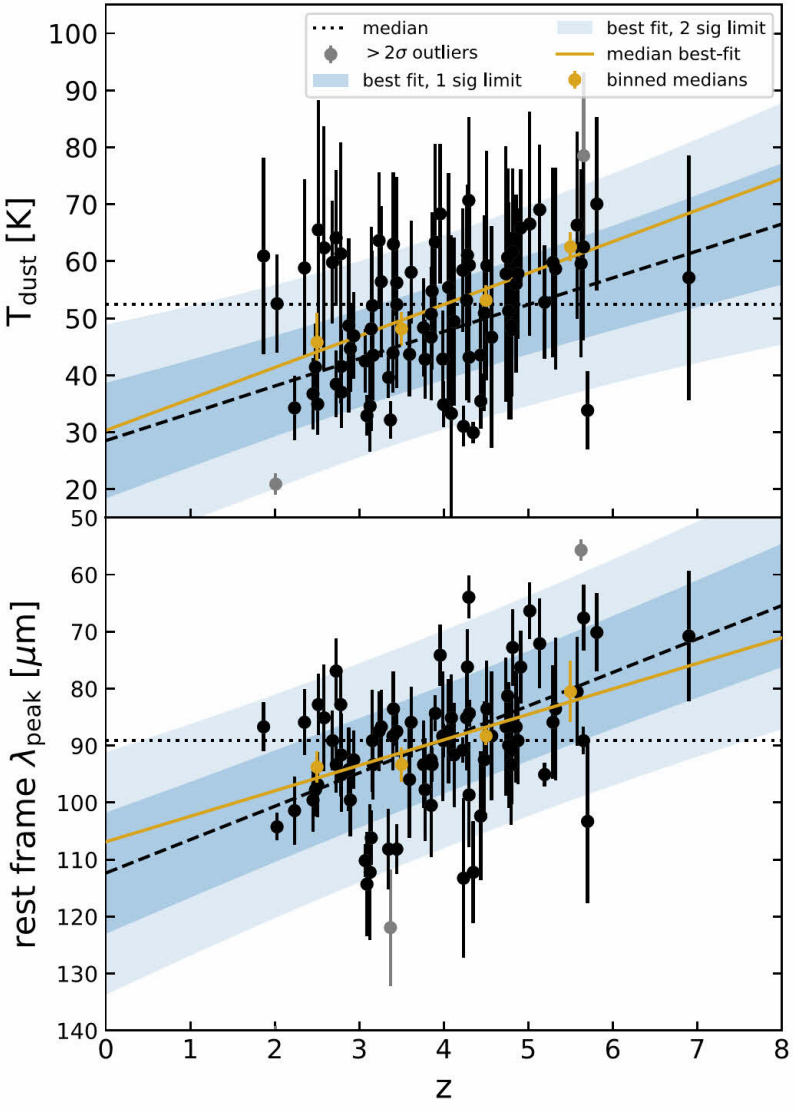


Figure 11. Top: fitting the dust temperature distribution (blue) yields a nonzero

SPT

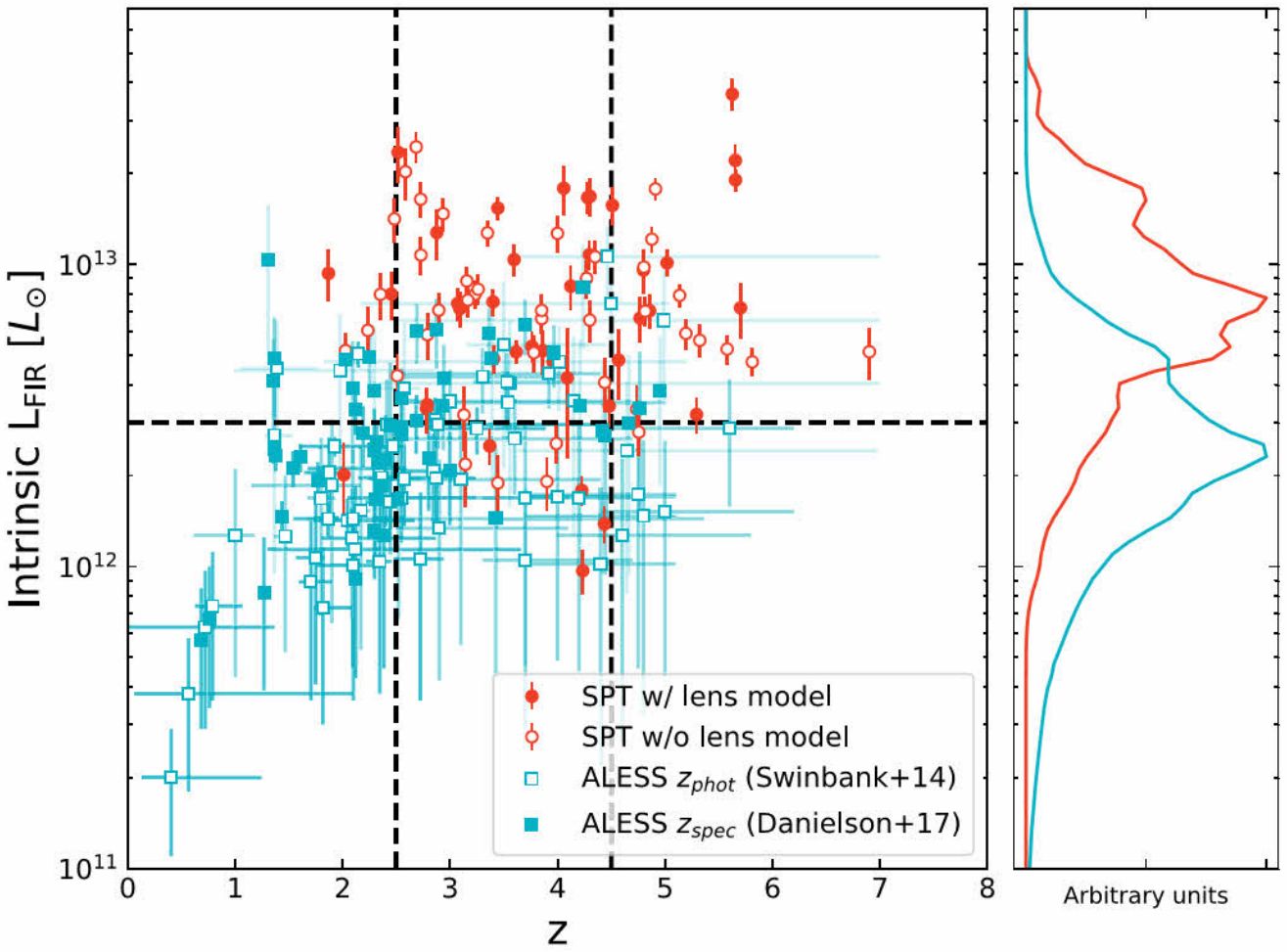


Figure 14. Intrinsic luminosity as a function of redshift for DSFGs from SPT

SPT

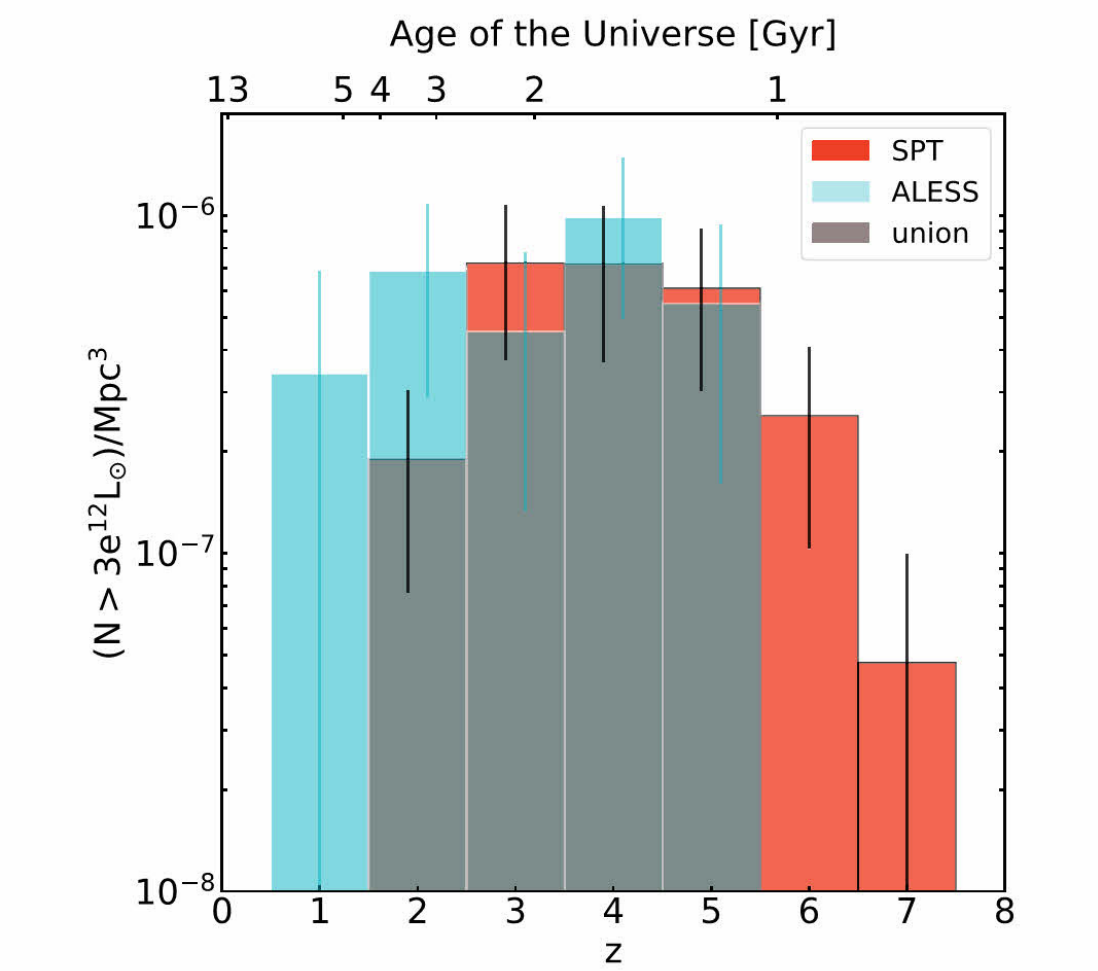


Figure 15. The spatial density of ALESS and SPT sources. Because the

ACT

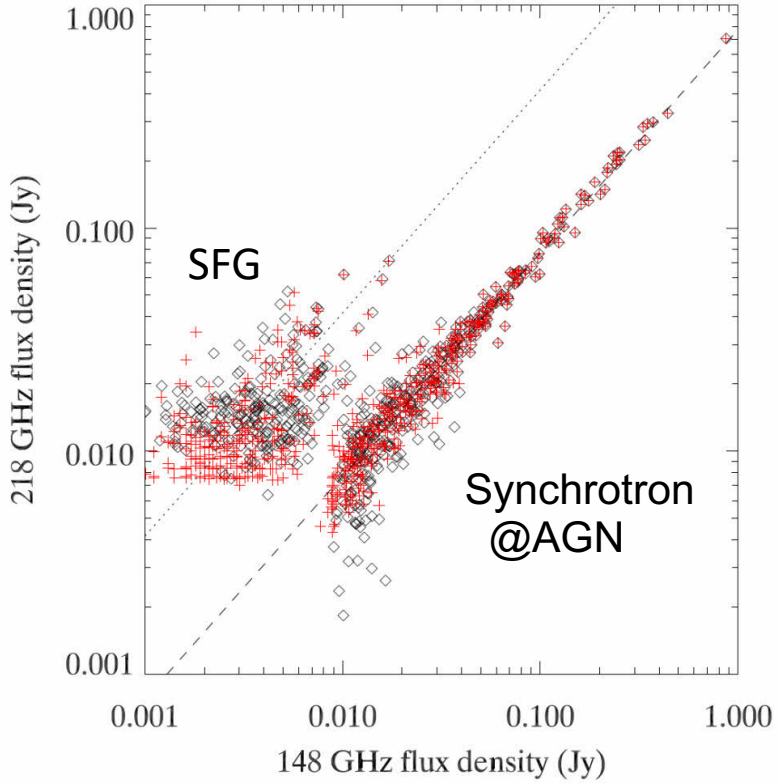


Figure 9. 148 GHz flux density vs. 218 GHz flux density. Black diamonds (red

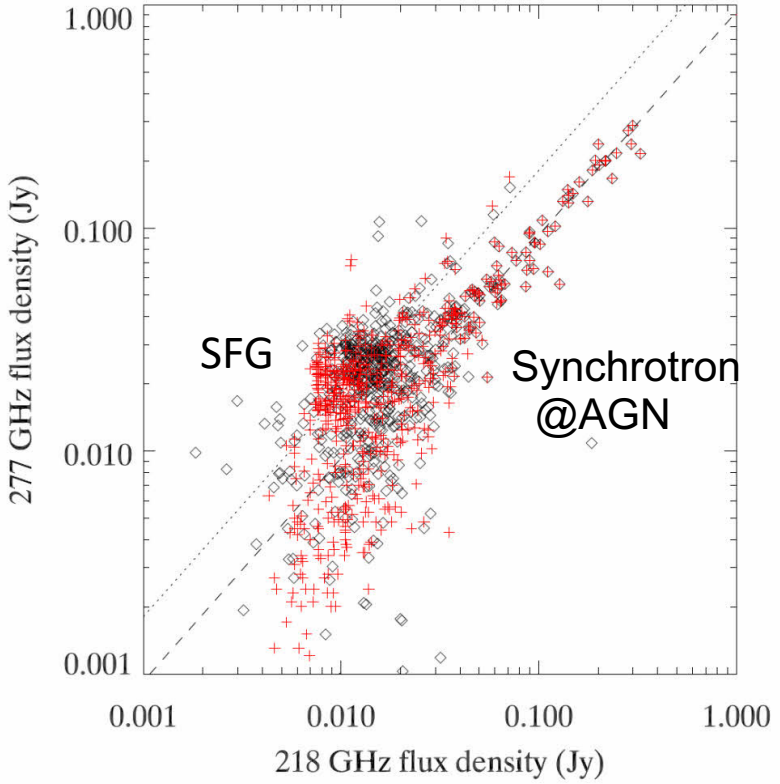


Figure 10. 218 GHz flux density vs. 277 GHz flux density. The plotting

350GHz@JCMT

N~3000
(>4.2mJy @3.5σ)
at 5 deg^2

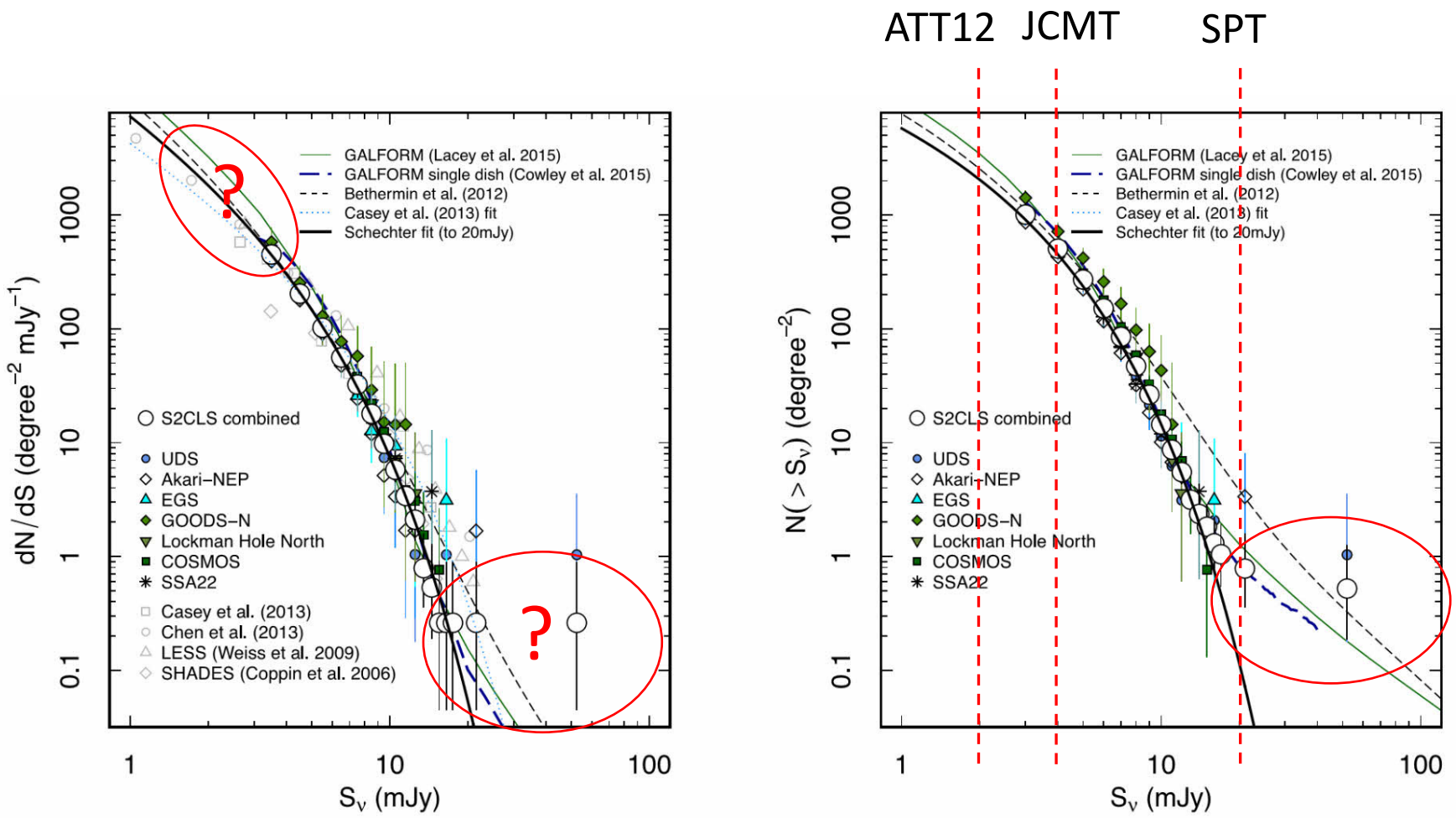


Figure 15. Number counts of 850 μm sources. The left-hand panel shows the differential number counts for individual fields and the combined survey, along

現状のまとめとATT

（現　状）

- 超広域サーベイ
  - ・深く狭い（JCMT 5deg^2）
  - ・浅く広い（SPT 2500deg^2）

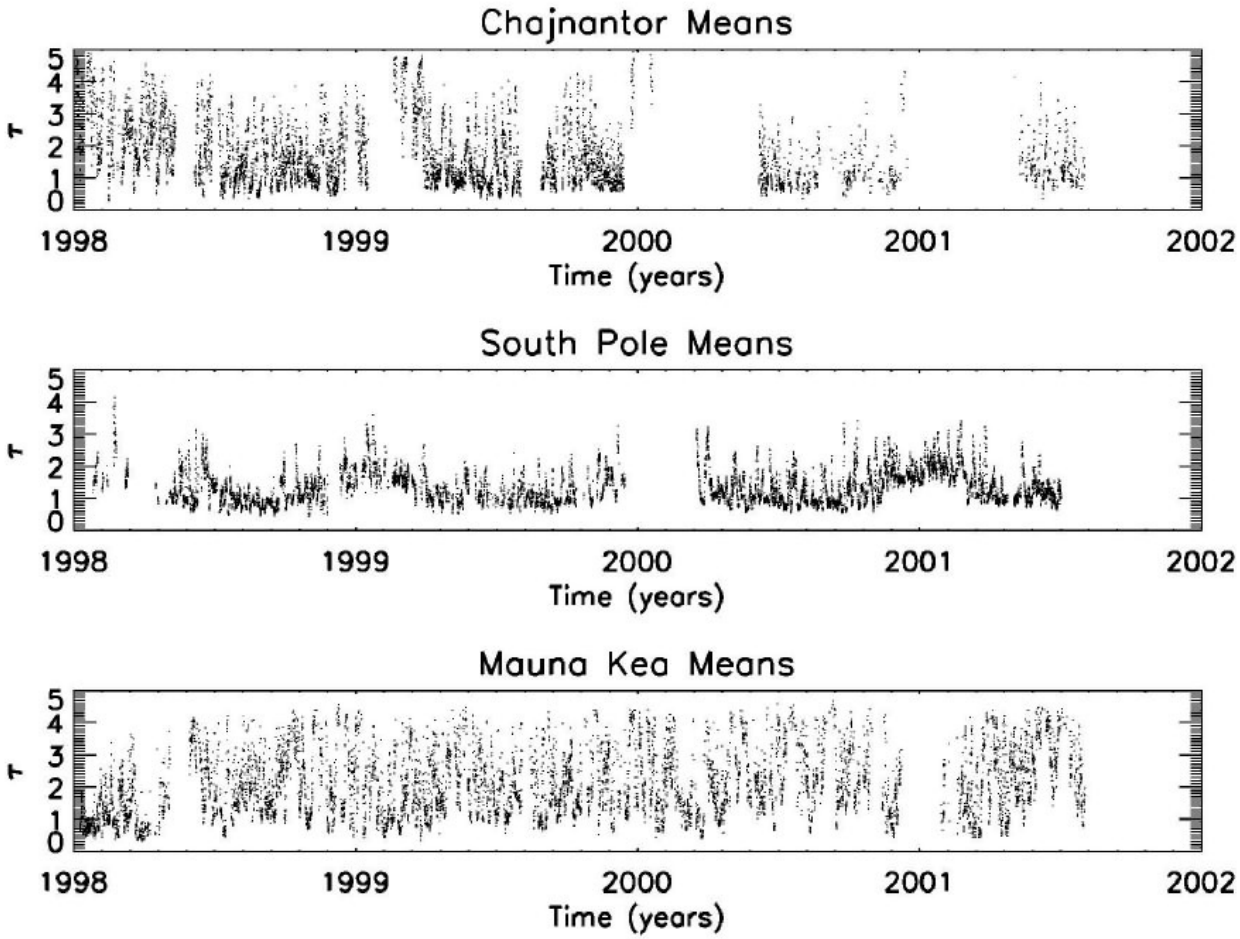
- 周波数帯
  - ・ミリ波（～200-350 GHz）
    650GHzでは不能(JCMT)

（ATT12）

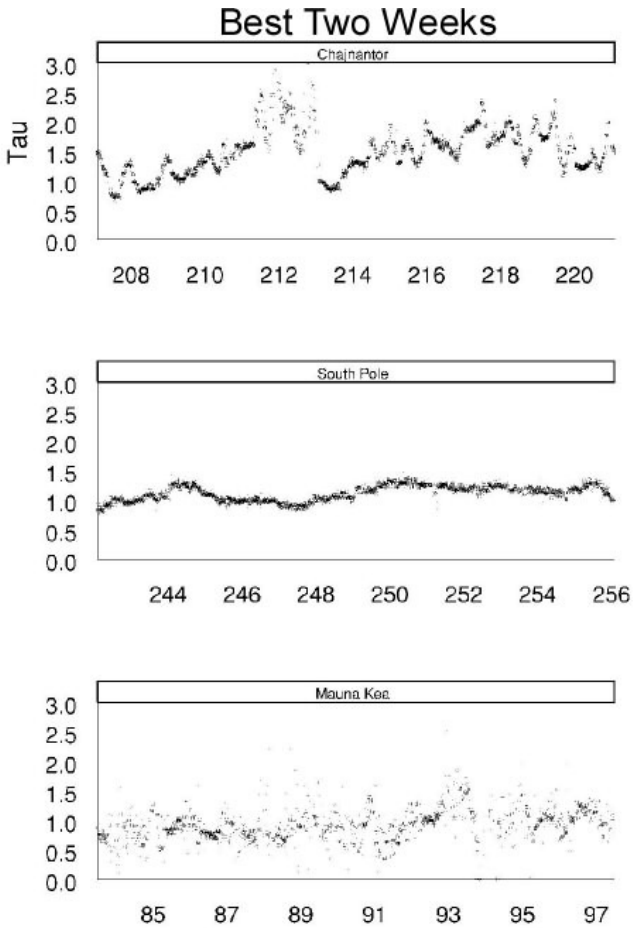
⇒・Confusion limits で
南天全体を
- ・超大光度銀河の超過？（統計）
- ・光度関数Φ(L) at z＝3～5
  →銀河進化
- ・星形成率（⇔ GRBの予想）

⇒ サブミリ波帯（460/850GHz）
- ・高Td（high-z？）検出に有利
- ・synchrotron(AGN)の影響小
- ・Tdの決定
- ・photo-zの決定

(850 GHz)



(a)



(b)

「新ドームふじ」はSPよりもっと良い

ATT12:南天全体@confusion-limits

$$\text{Mapping speed (MS)} = \frac{N\Omega}{NEFD^2}$$

D=12m,　PWV=0.14mm（冬季50%）,　ε=20μm
　1周波数1カメラ（7ユニット）

$$\text{MS}(400) = \frac{700\times7\times2.10\times10^{-5}[\text{deg}^2]}{\left(6.97\left[\text{mJy Hz}^{-1/2}\right]\right)^2}\times3600 = 7.63\ [\text{deg}^2\ \text{hr}^{-1}\ \text{mJy}^{-2}]$$

$$\text{MS}(850) = \frac{3000\times7\times4.62\times10^{-6}[\text{deg}^2]}{\left(19.8\ [\text{mJy Hz}^{-1/2}]\right)^2}\times3600 = 0.891\ [\text{deg}^2\ \text{hr}^{-1}\ \text{mJy}^{-2}]$$

$$\text{MS}(1300) = \frac{1200\times7\times1.98\times10^{-2}[\text{deg}^2]}{\left(152\ [\text{mJy Hz}^{-1/2}]\right)^2}\times3600 = 2.59\times10^{-3}\ [\text{deg}^2\ \text{hr}^{-1}\ \text{mJy}^{-2}]$$

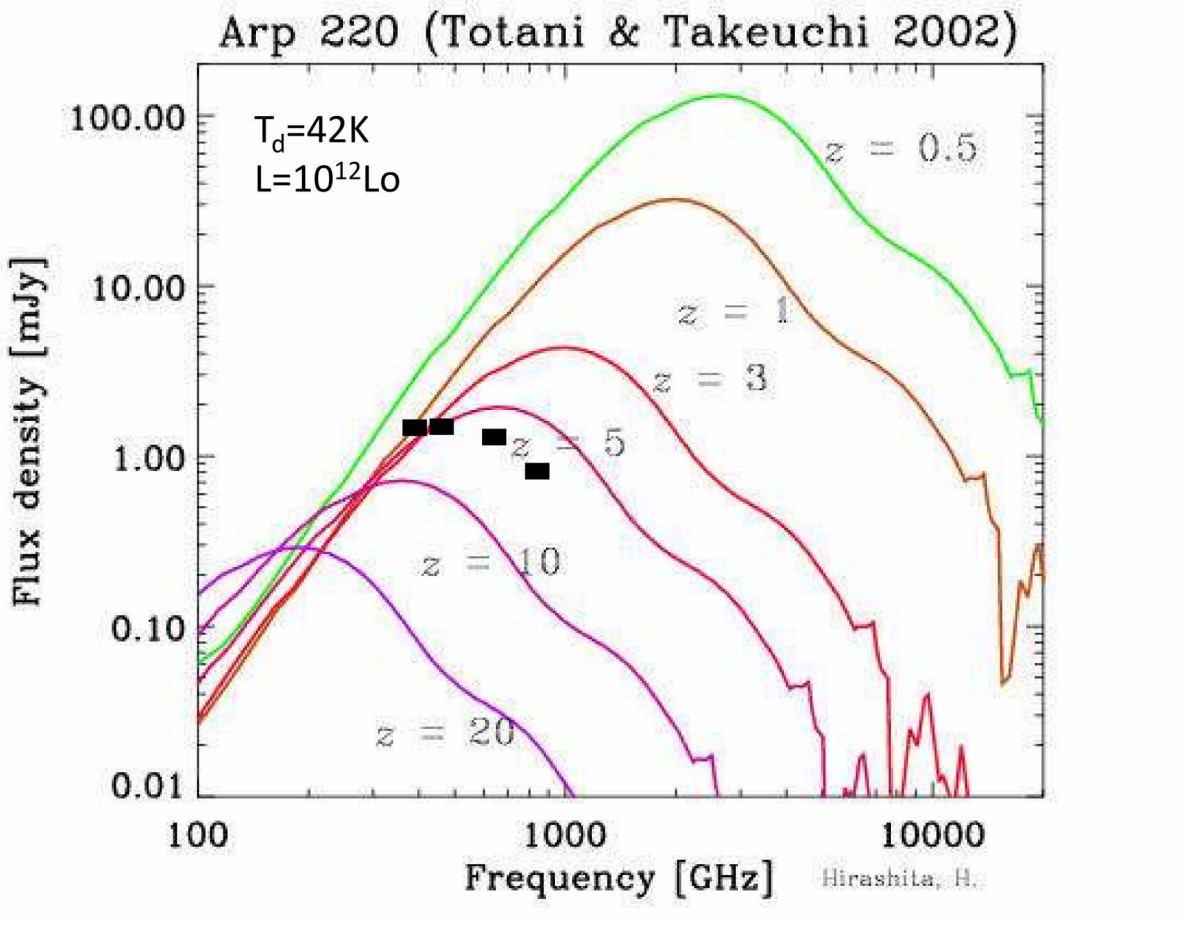
南天全体（2π=2 0626deg^2）を観測するのに要する年数

（仮定）１年（8766 hr）の約1/3（3000 hr）を掃天観測に割り当て

Freq [GHz]	5rms [mJy]	１シーズン（年）に観測できる面積（deg^2）	必要年数 [yr]
400	1.5 (CL)	5 1778 [deg^2]	0.40
	2.0	9 1517	0.23
460	1.6 (CL)	2 2882	0.86
650	1.3 (CL)	8089	2.5
850	0.83 (CL)	1841	11.2
	1.0	2673	7.7
1300	12	1120	18.4
	20	3111	6.6

- ✓ 460GHz, CL, ~1 season (1 yr), completed
- ✓ 850GHz, CL, ~10 season (10 yr), completed (except Galactic plane)
- ✓ 1300GHz, no large-field mapping, only pointed observations

「南天全体を confusion limit で掃天観測」



Case: L=10^{12}Lo, Td=42K （Arp220）

1st: 460 GHz, ＜1 yr → z <=5
2nd: 850 GHz, ～10 yr → z <=7

Case: $L=10^{13}L_o$

TDB