The Frequency of Debris Disks at White Dwarfs

Sara D. Barber

CoAuthors:
Adam J. Patterson, Mukremin Kilic, Sandy K. Leggett,
Patrick Dufour, Joshua S. Bloom, Dan L. Starr

Previous Excess Searches

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	400	SPY DA $_{\tau<0.5\ \mathrm{Gyr}}$		IRAC	2 – 3 %[*]
	70	SPY DA $_{0.5<\tau<1.5\ \mathrm{Gyr}}$		IRAC	1 – 2 %[*]
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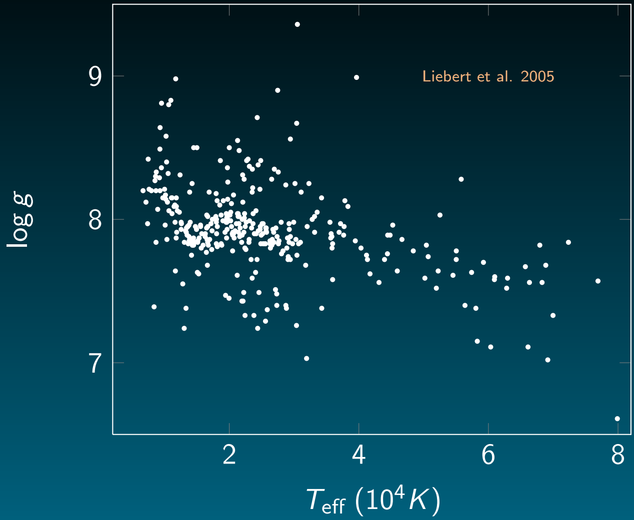
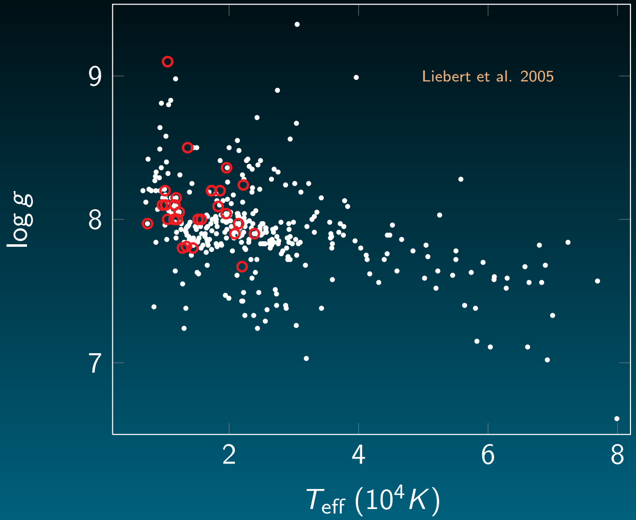


Sample Selection



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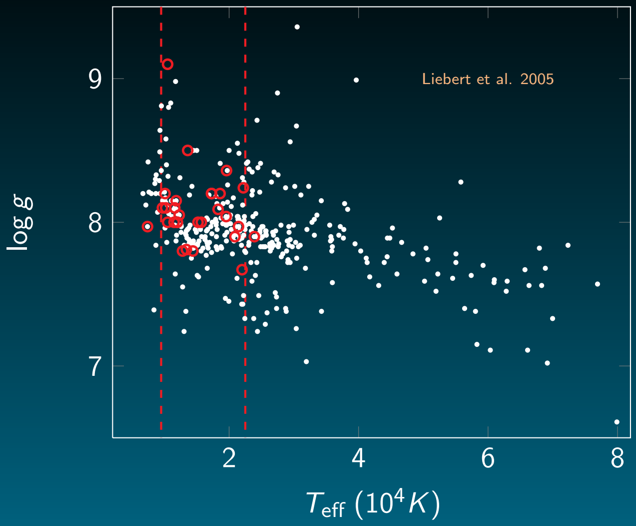

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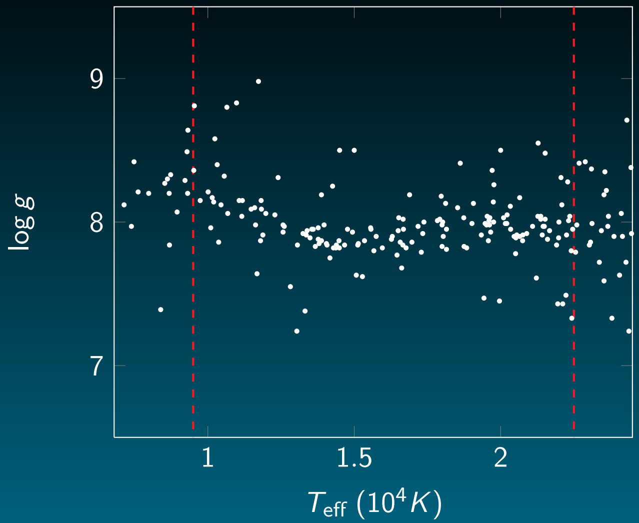

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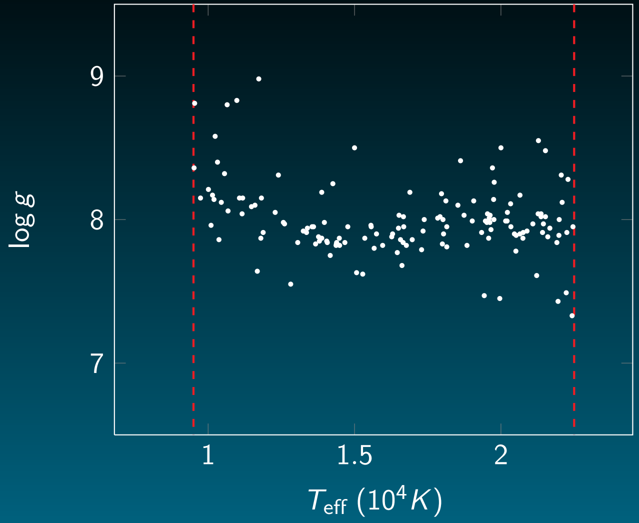

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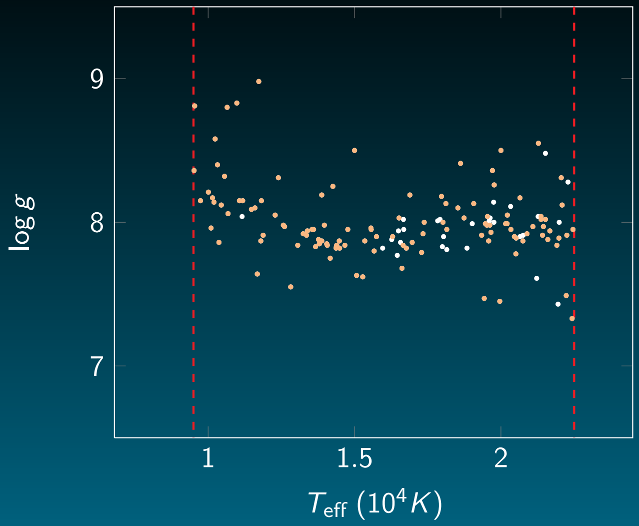

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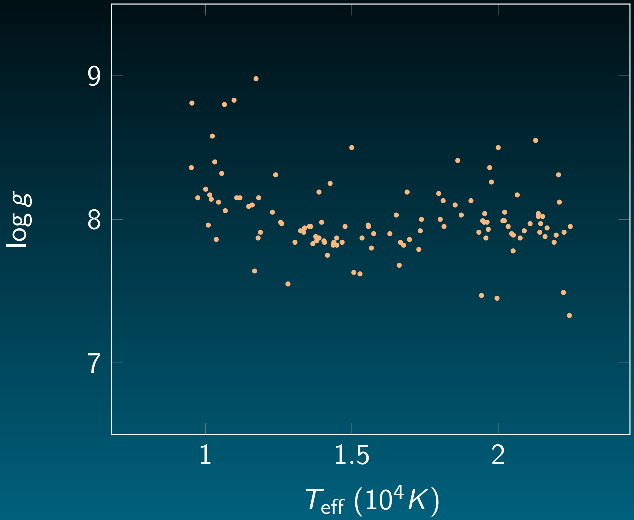
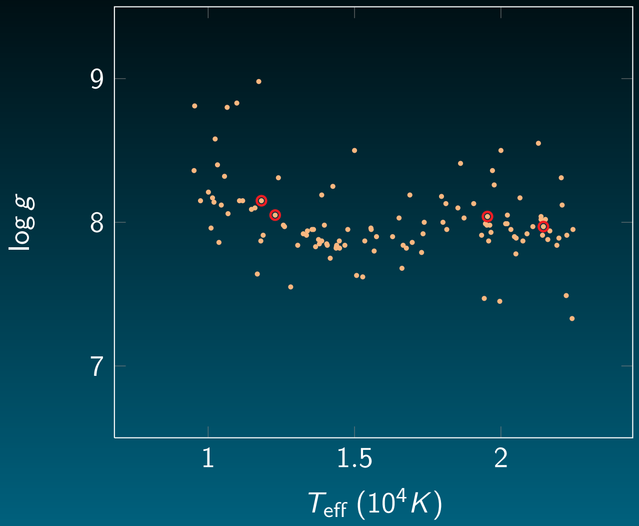


Results



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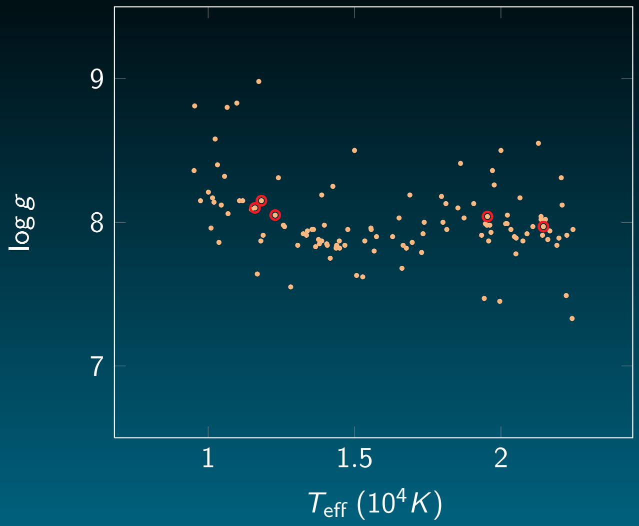

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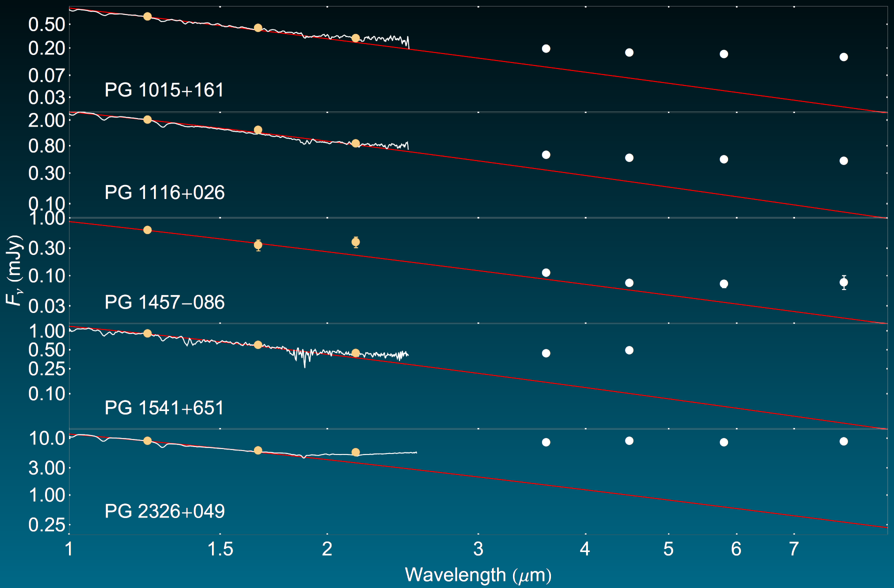

PG 1015+161
PG 1116+026
PG 1457−086
PG 1541+651
PG 2326+049
F_ν (mJy)
Wavelength (μm)
0.50
0.20
0.07
0.03
2.00
0.80
0.30
0.10
1.00
0.30
0.10
0.03
1.00
0.50
0.25
0.10
10.0
3.00
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1
1.5
2
3
4
5
6
7

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Barber et al. 2012	117	PG DA B<16	9.5 – 22.5	PAIRITEL SpeX/IRAC	4.3 %

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Accretion Timescales

- Avg. cooling age = 300 Myr
- Avg. accretion time = 10 Myr
  - Disk lifetime from single disruption event = 10^5 yr[1]
  - 100 disruption events on avg.

- PR accretion rate = 10^8 g/s[2]
  - Total mass accreted = 10^{22} g
- High observed accretion rate = 10^{11} g/s[3]
  - Total mass accreted = 10^{24}g[4]

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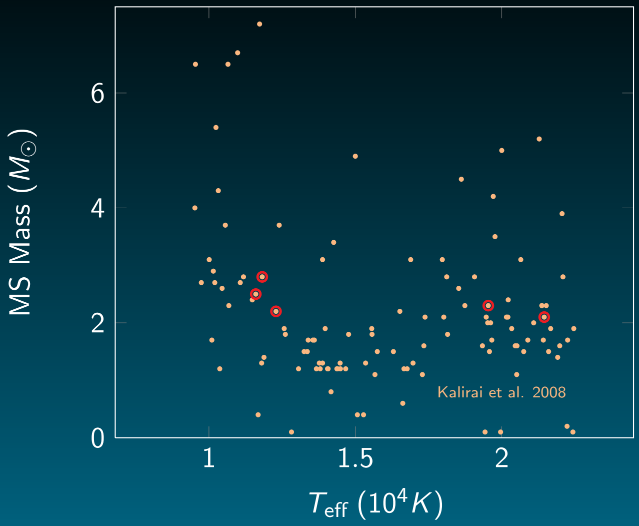
Planets Around MS Stars



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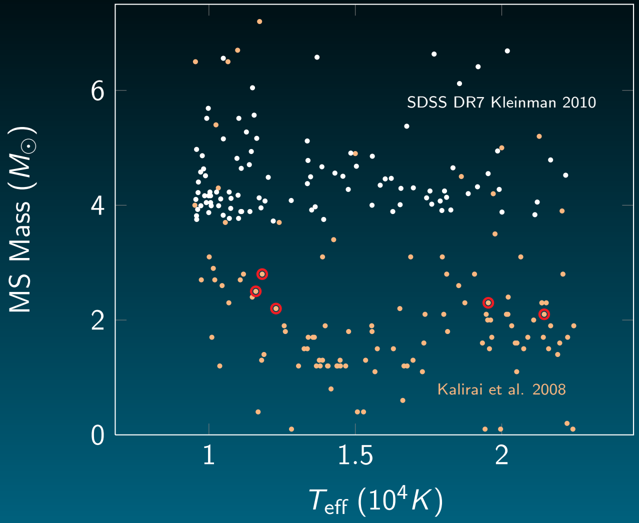

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