

# How Stable is the Eppley PIR?

(Broadband Infrared Measurements)

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- Blackbody calibrations over 15 year period

$$L = \frac{U_{emf}}{c} + \sigma T_B^4 - k\sigma(T_D^4 - T_B^4)$$

$$\sigma T_{BB}^4 = \frac{U_{emf}}{c} + \sigma T_B^4 - k\sigma(T_D^4 - T_B^4)$$

$$c = \frac{U_{emf}}{\sigma(T_{BB}^4 - T_B^4)}$$



Eppley Precision Infrared Radiometer (PIR)

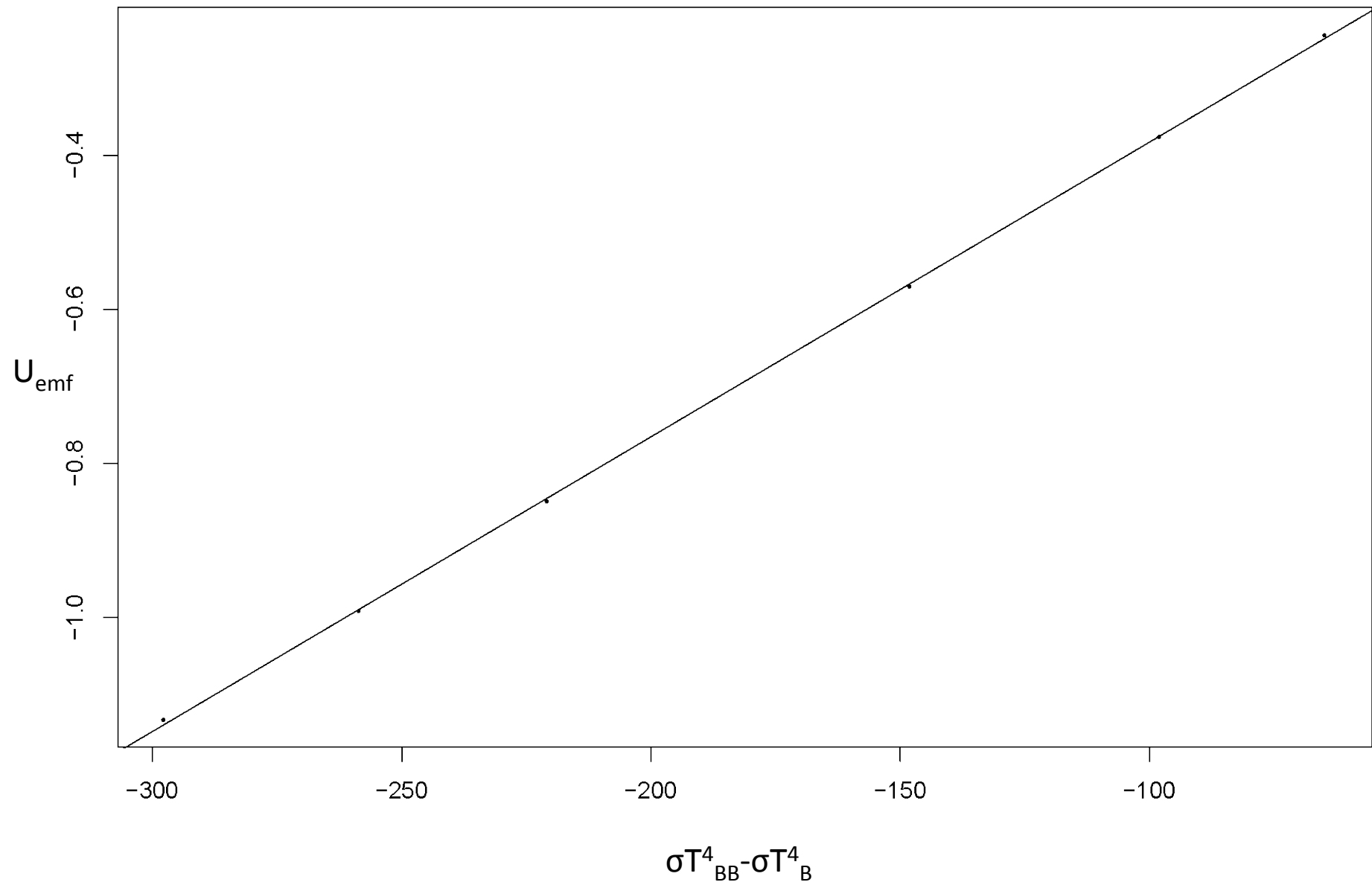


LD2C

LD2C 20

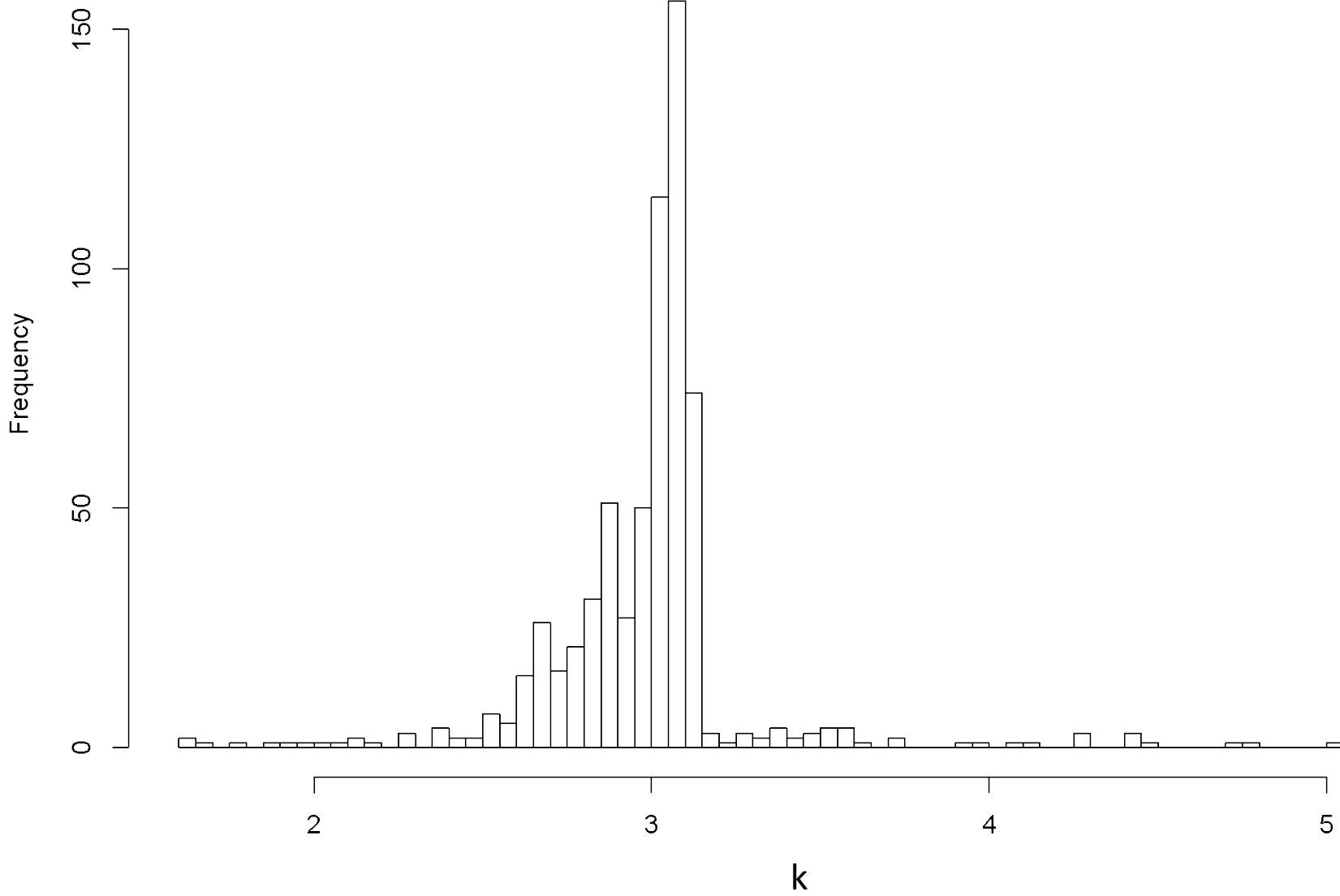
Handwritten notes on a printed manual, including a list of items and a signature.

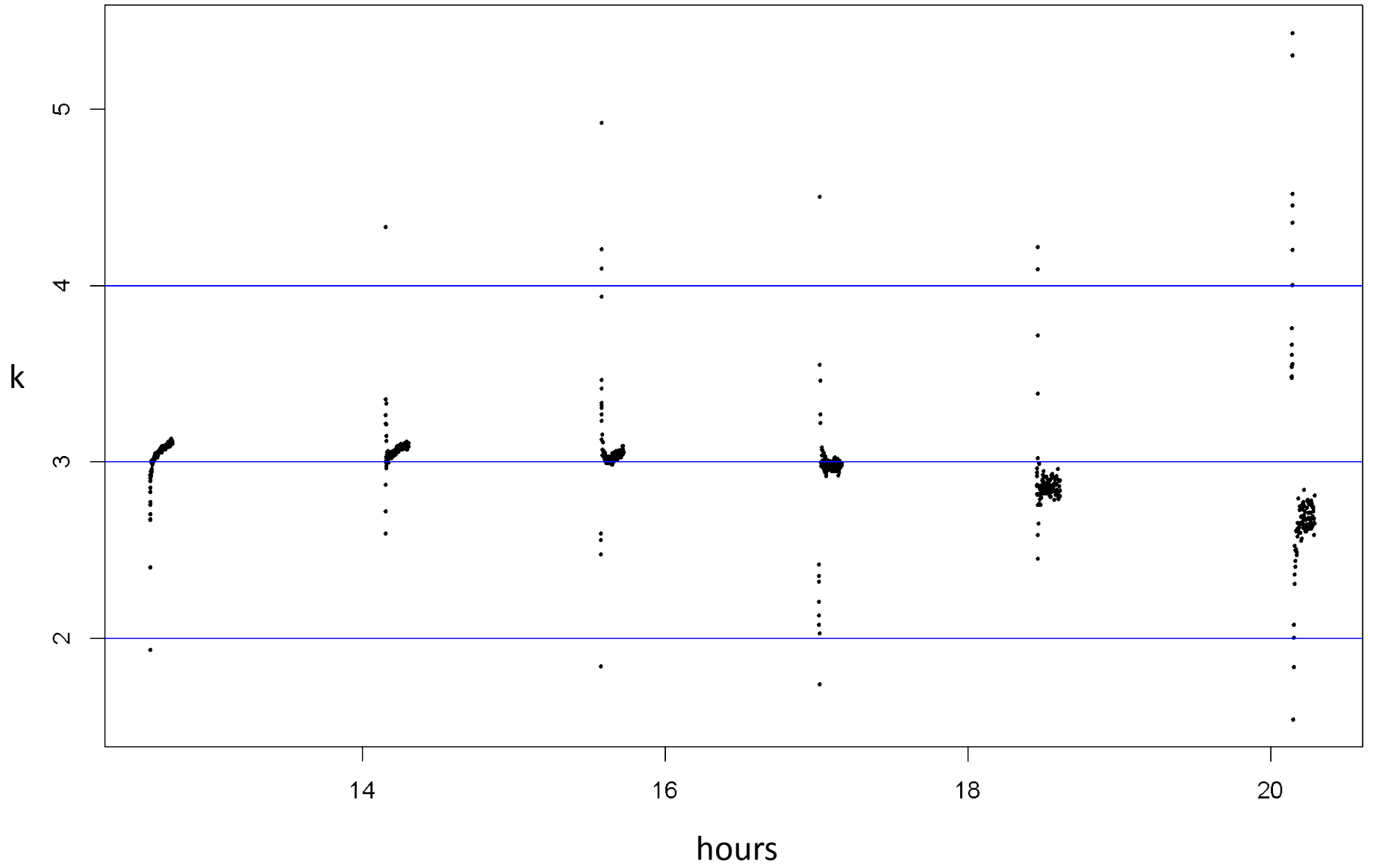
Yellow notepad with handwritten notes.



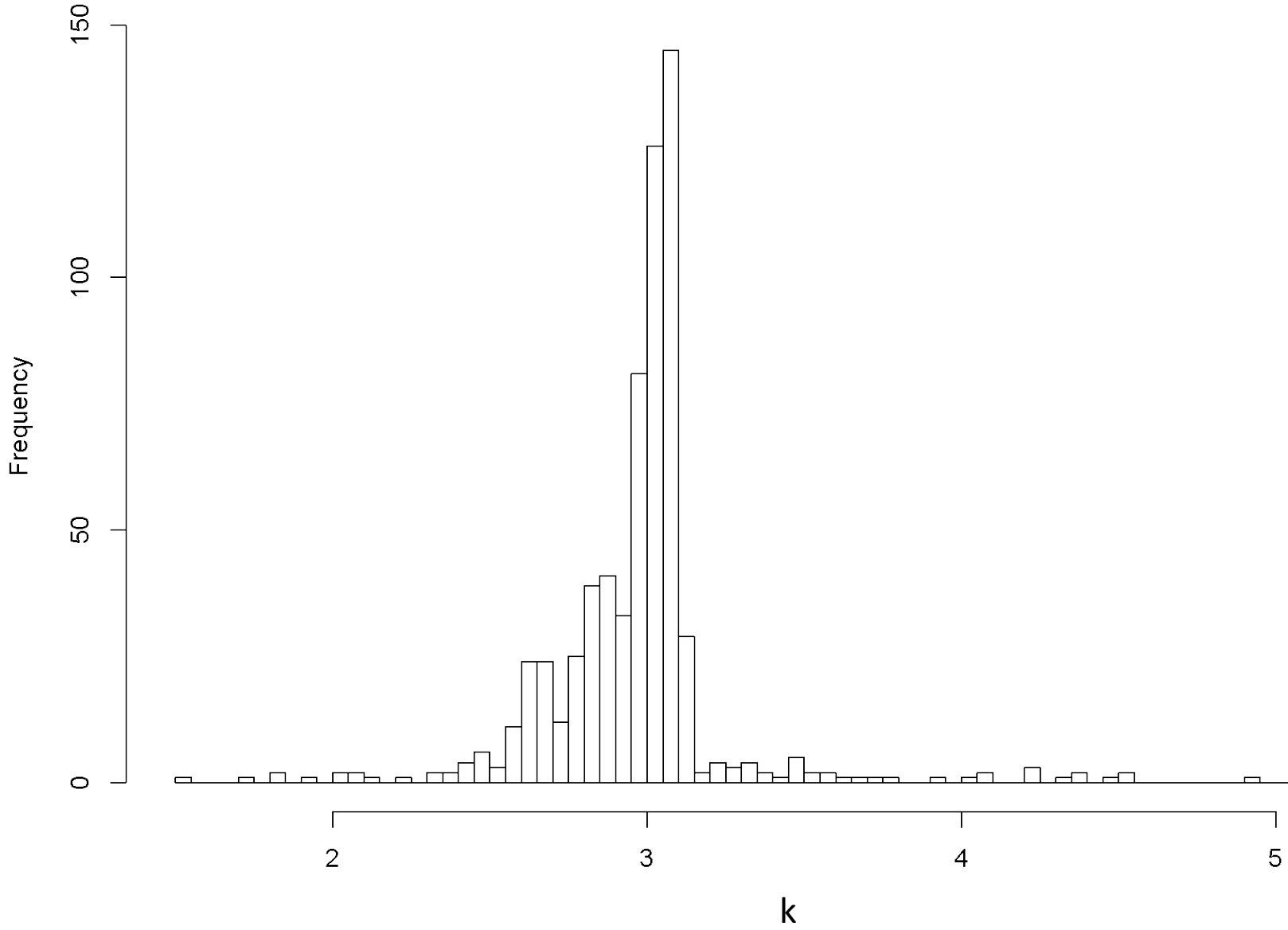


Histogram of kk

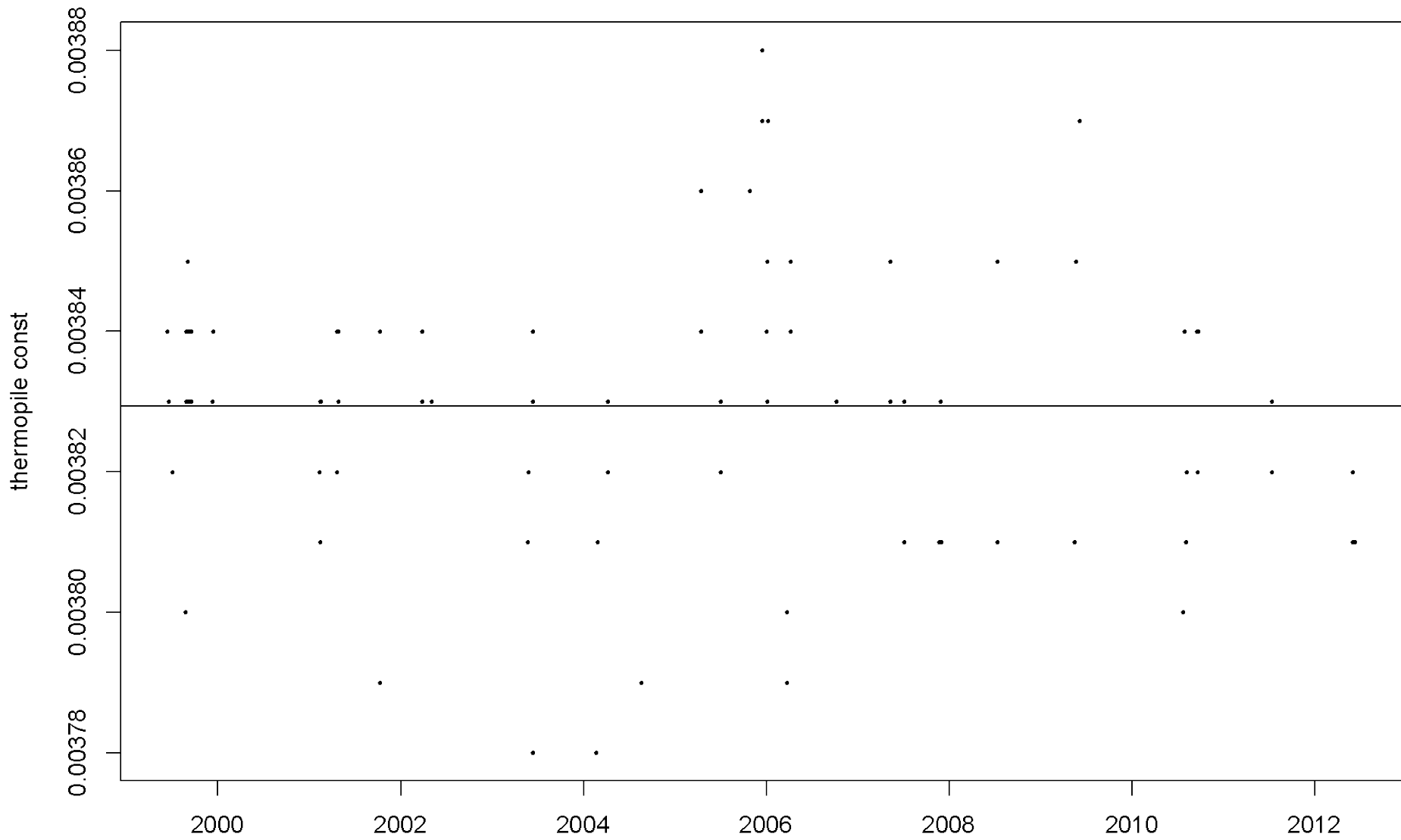




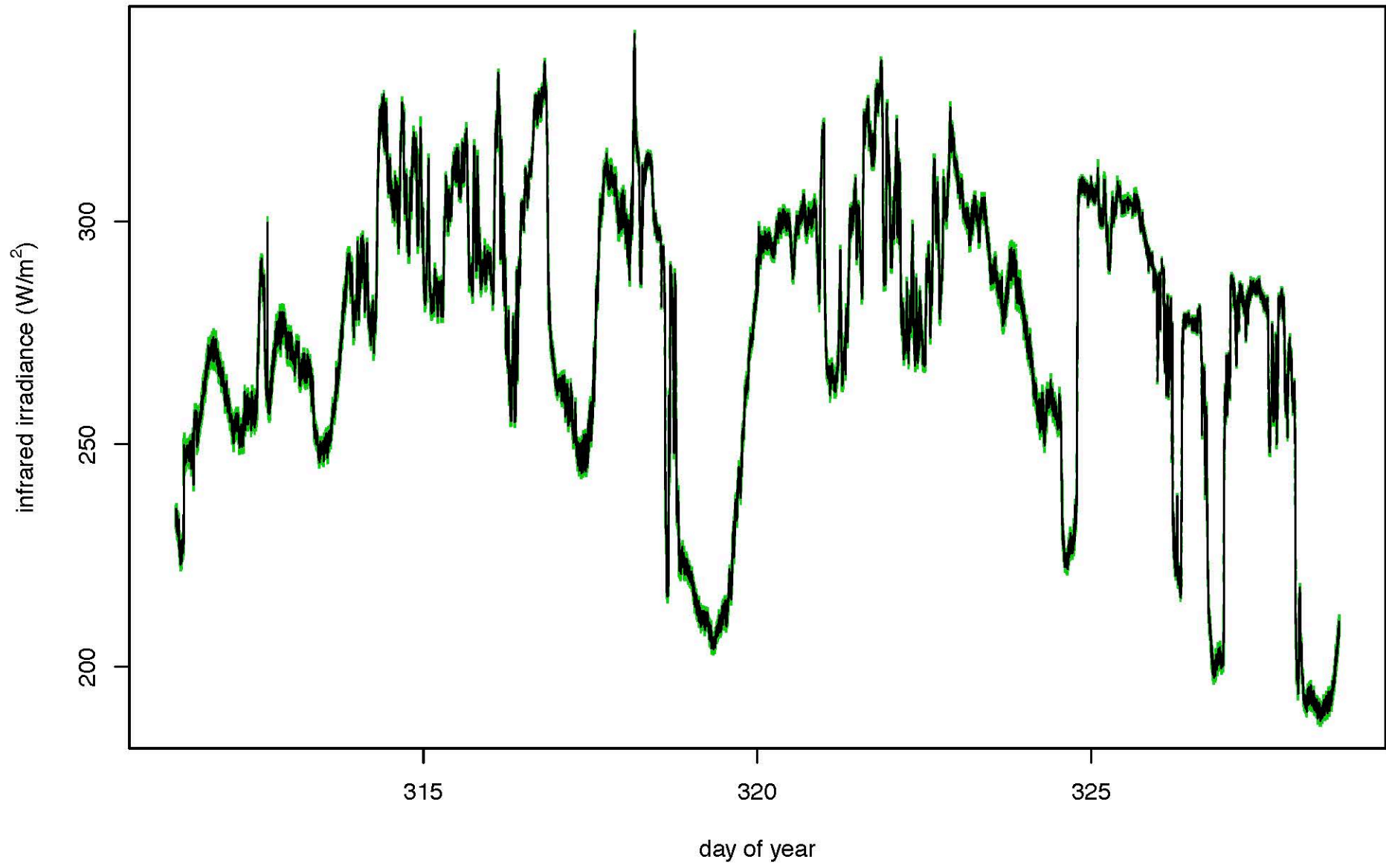
Histogram of kk

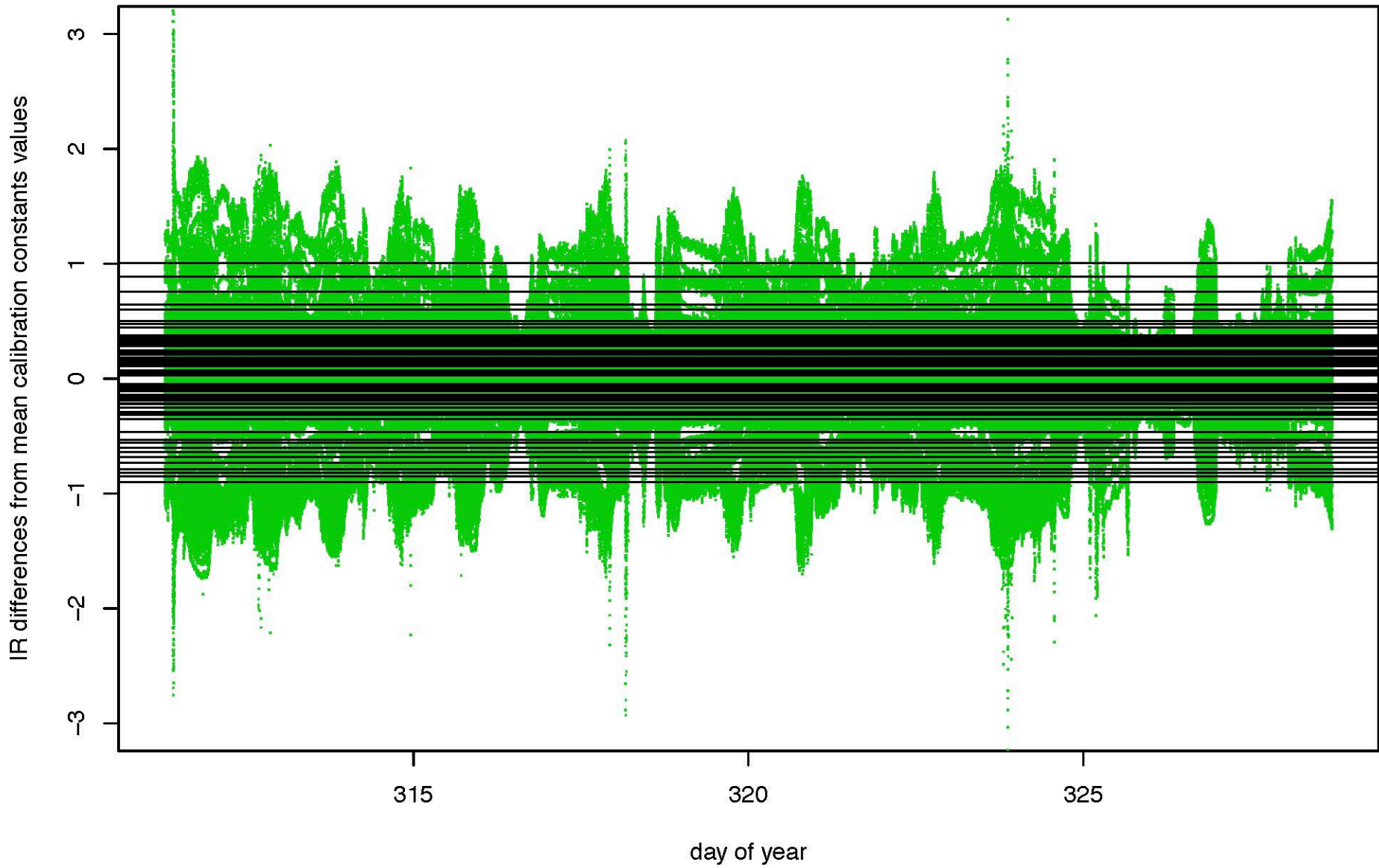












Station: BAO8		Project: RAD					
Ch	Date/time on	Date/time off	Inst	Task	Type		
7	29-JUL-1991 20:41:31	8-APR-1993 16:06:30	27415	D_IR	PYRGEOMETER		
10	30-JUL-2001 10:18:31	26-FEB-2004 16:52:30	27415	U_IR	PYRGEOMETER		

Station: BERM		Project: RAD					
Ch	Date/time on	Date/time off	Inst	Task	Type		
10	11-SEP-2007 14:11:31	24-MAY-2010 12:35:30	27415	D_IR	PYRGEOMETER		

Station: KWAJ		Project: RAD					
Ch	Date/time on	Date/time off	Inst	Task	Type		
4	1-NOV-1993 12:00:31	16-APR-1996 17:02:30	27415	D_IR	PYRGEOMETER		

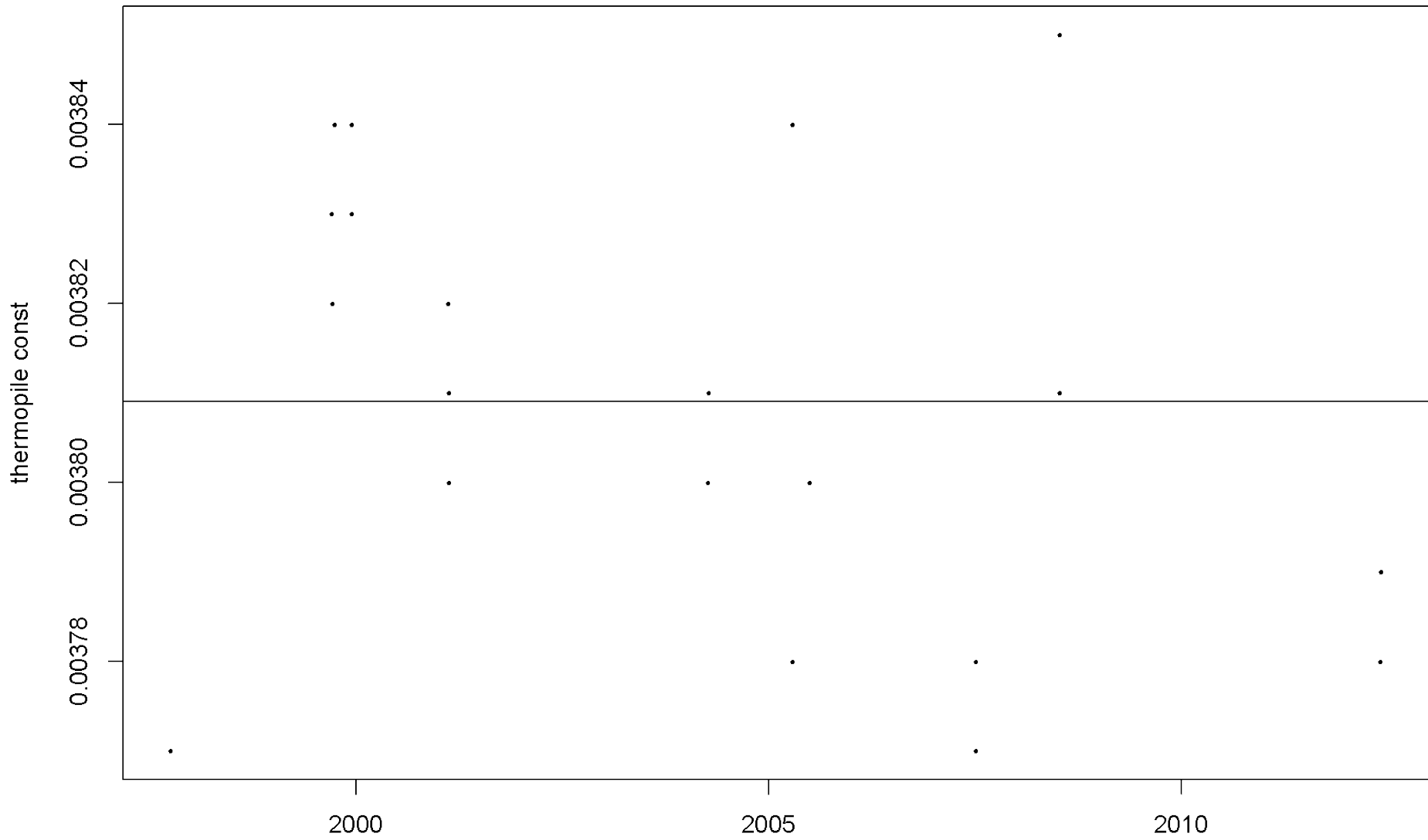
Station: BRW		Project: RAD					
Ch	Date/time on	Date/time off	Inst	Task	Type		
2	24-JUL-2009 22:00:31	18-AUG-2011 23:46:30	27415	D_IR	PYRGEOMETER		

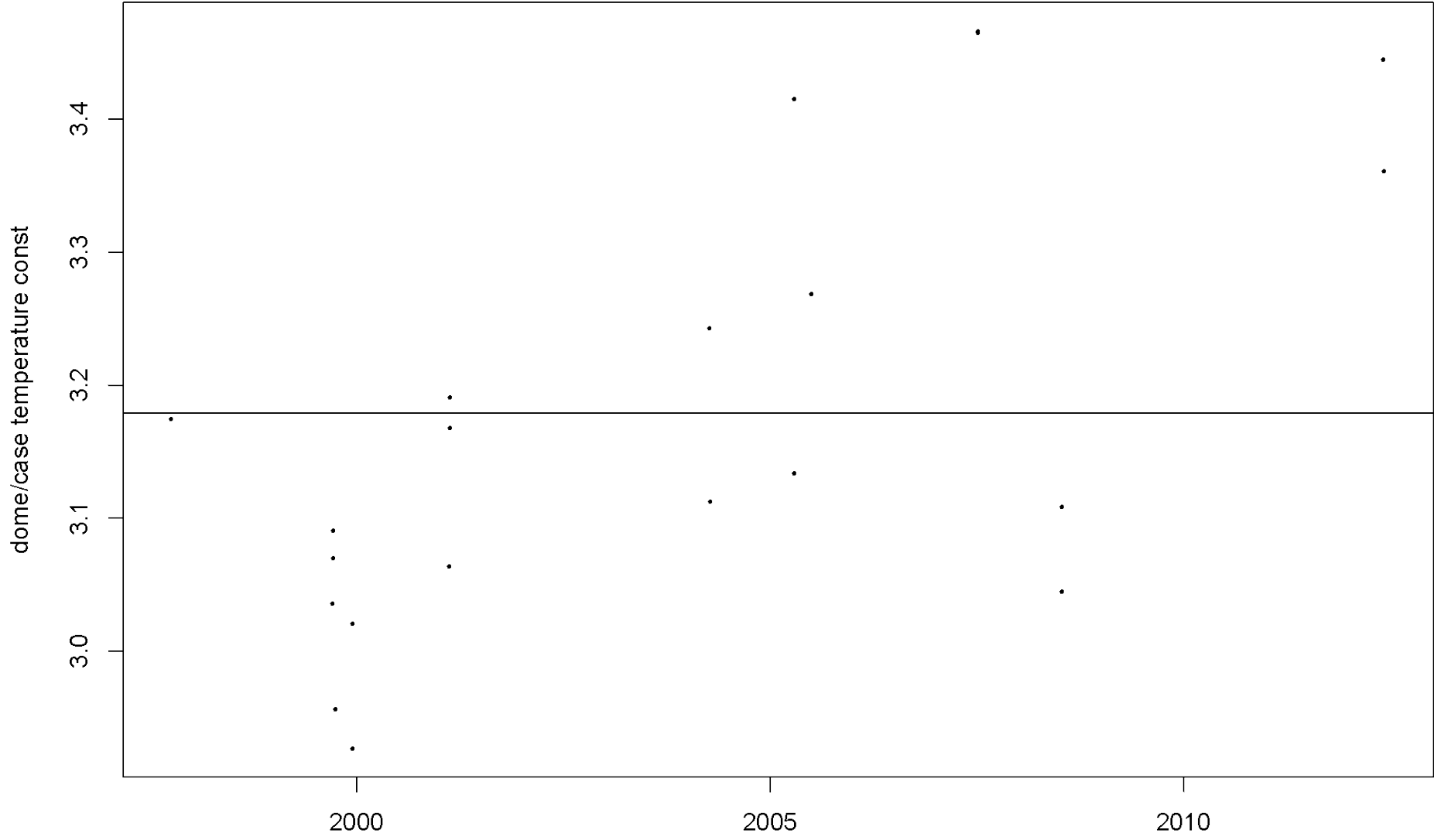
Station: SKAG		Project: RAD					
Ch	Date/time on	Date/time off	Inst	Task	Type		
2	13-APR-1999 16:24:31	28-JAN-2000 18:32:30	27415	D_IR	PYRGEOMETER		
6	29-JUL-2008 15:15:31	5-MAR-2009 23:40:30	27415	D_IR2	PYRGEOMETER		
6	28-MAY-2009 00:00:31	3-JUN-2009 19:28:30	27415	D_IR2	PYRGEOMETER		

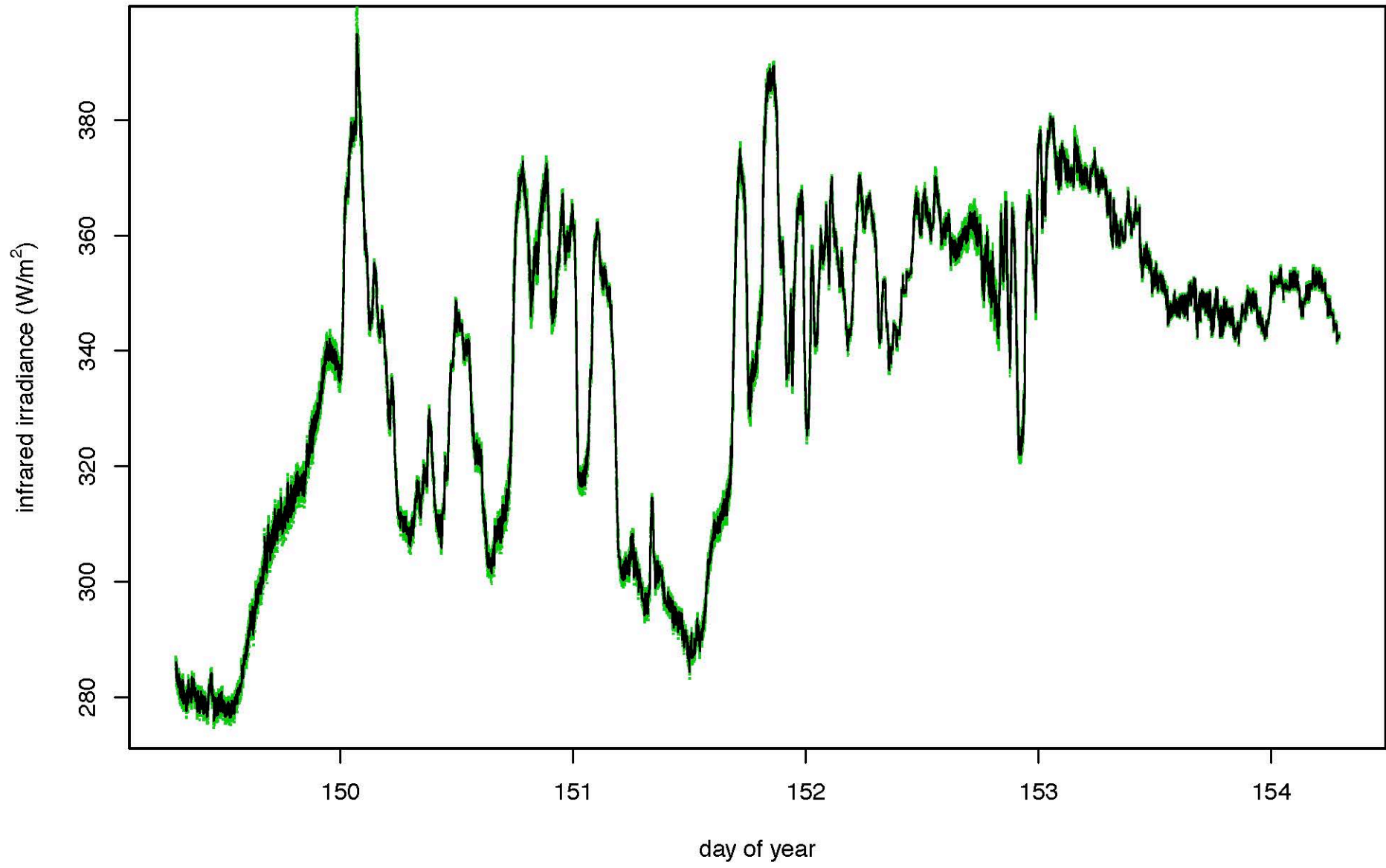
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Ch	Date/time on	Date/time off	Inst	Task	Type		
12	9-JAN-2006 19:03:31	23-MAY-2006 18:46:30	27415	D_IR	PYRGEOMETER		

Station: NENA		Project: RAD					
Ch	Date/time on	Date/time off	Inst	Task	Type		
2	27-MAY-2004 05:59:30	25-JUN-2004 00:00:00	27415	D_IR	PYRGEOMETER		
2	28-JUN-2004 16:39:30	14-AUG-2004 17:06:30	27415	D_IR	PYRGEOMETER		

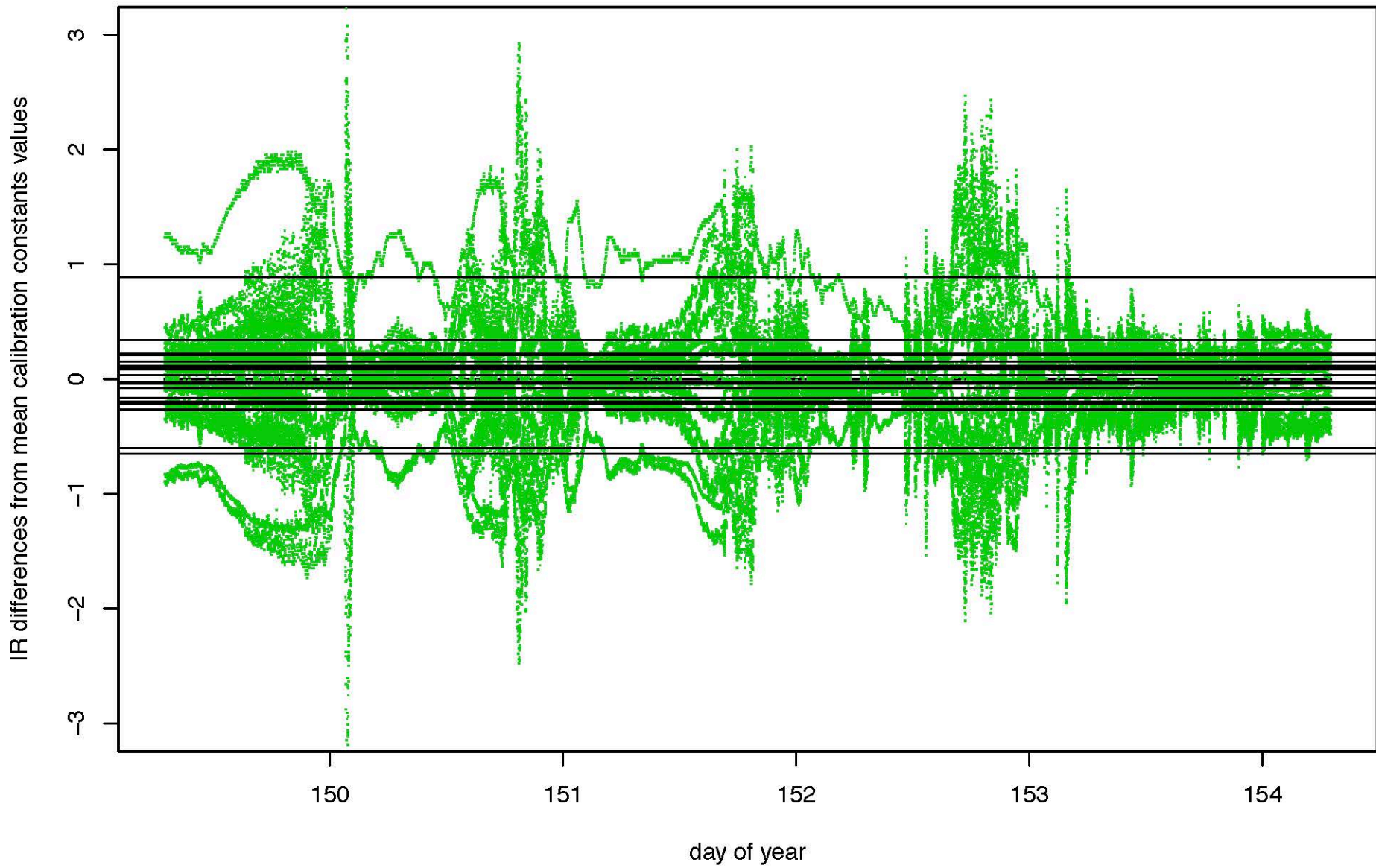
Station: SUM		Project: RAD2					
Ch	Date/time on	Date/time off	Inst	Task	Type		
3	16-AUG-2013 23:59:31		27415	D_IR	PYRGEOMETER		











# Conclusions

- Eppley Precision Infrared Radiometers (PIRs) are very stable
- The blackbody calibration technique we use is quite stable
- PIRs can be used to detect long-term changes in downwelling infrared to about  $0.5 \text{ Wm}^{-2}$  even if the scale changes