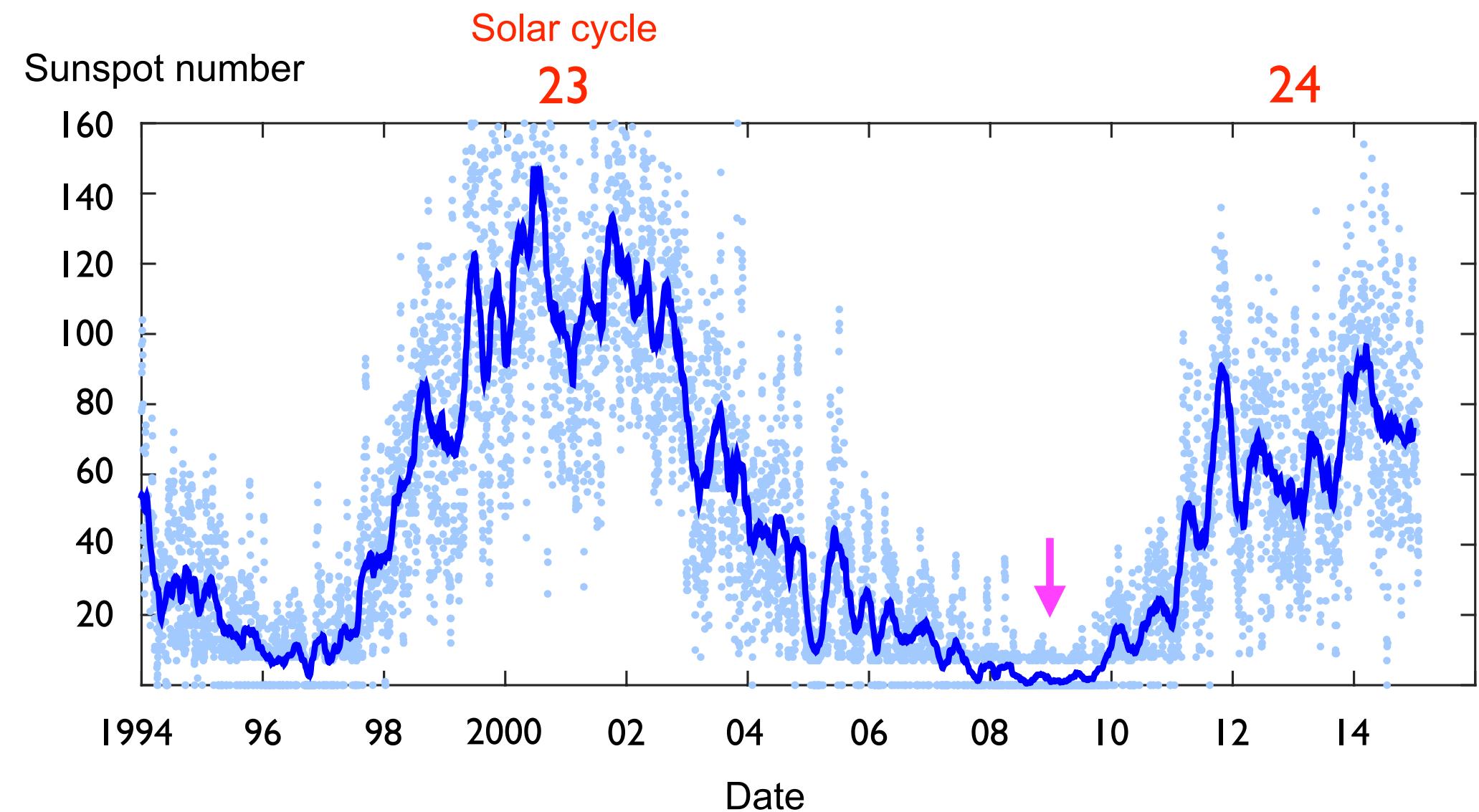


Long term variation of space weather activity

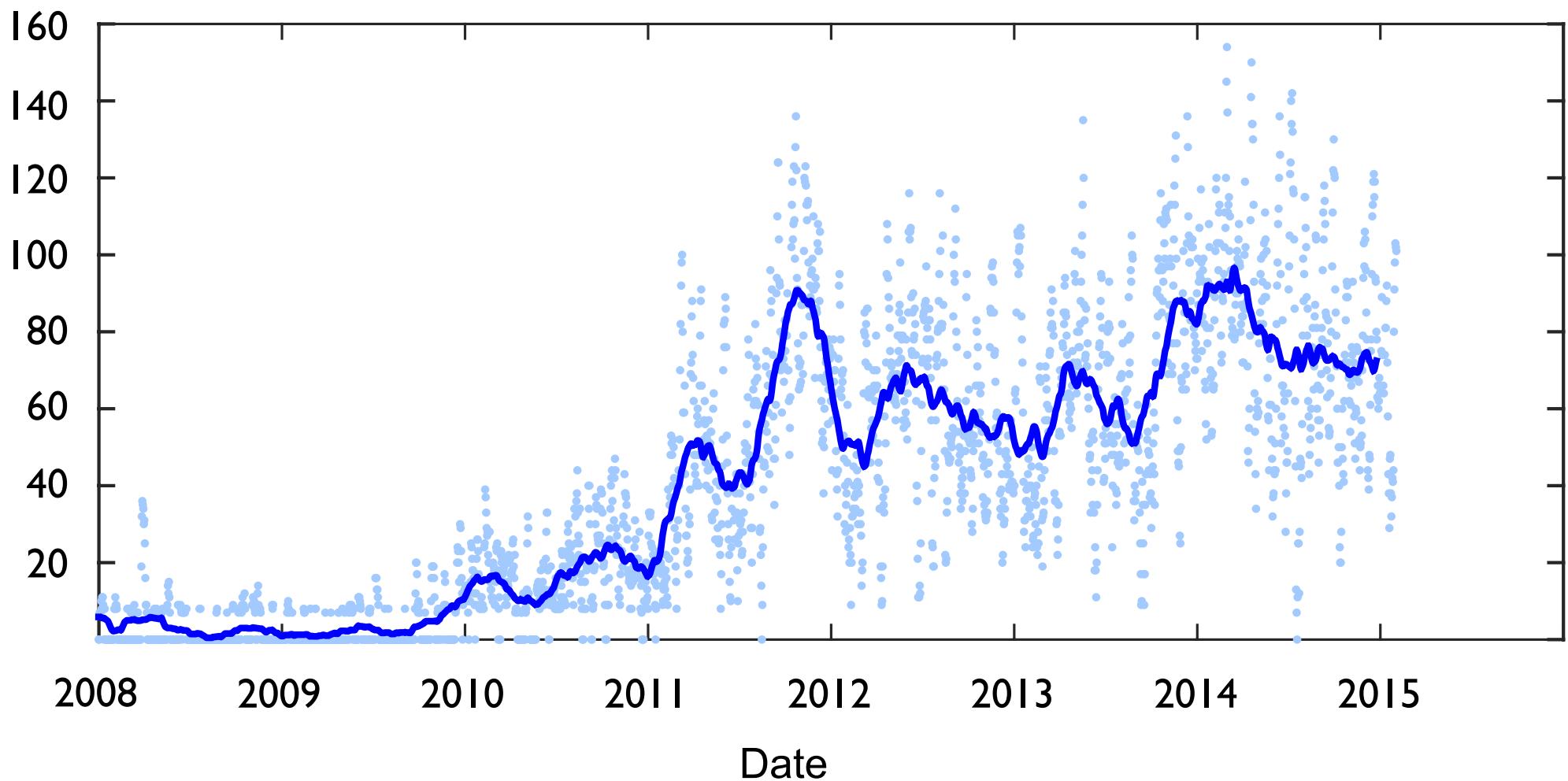
Manabu Shinohara
Kagoshima National College of Technology

Sunspot numbers : 1994 – 2015



Sunspot numbers : 2008 – 2015

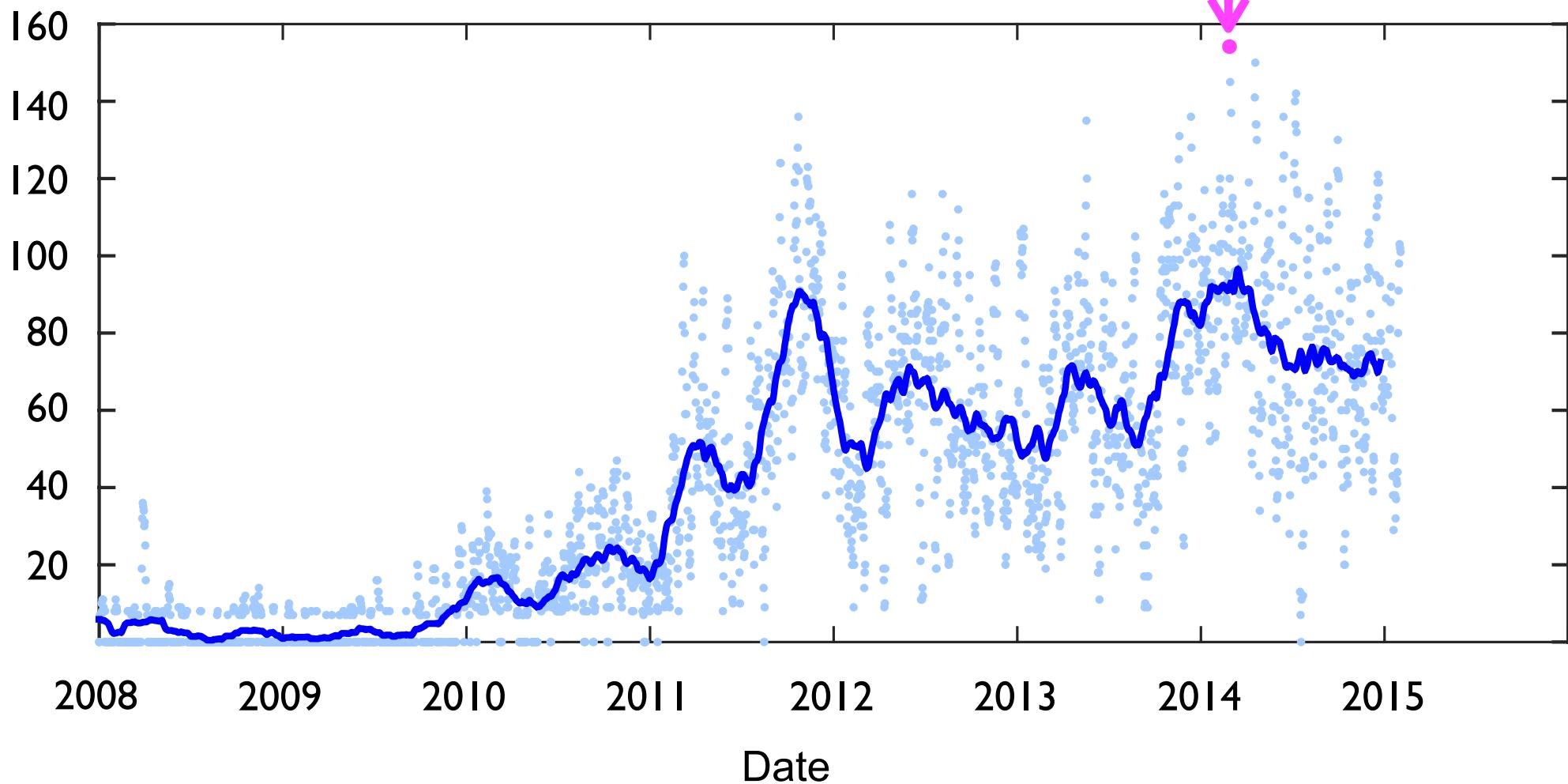
Sunspot number



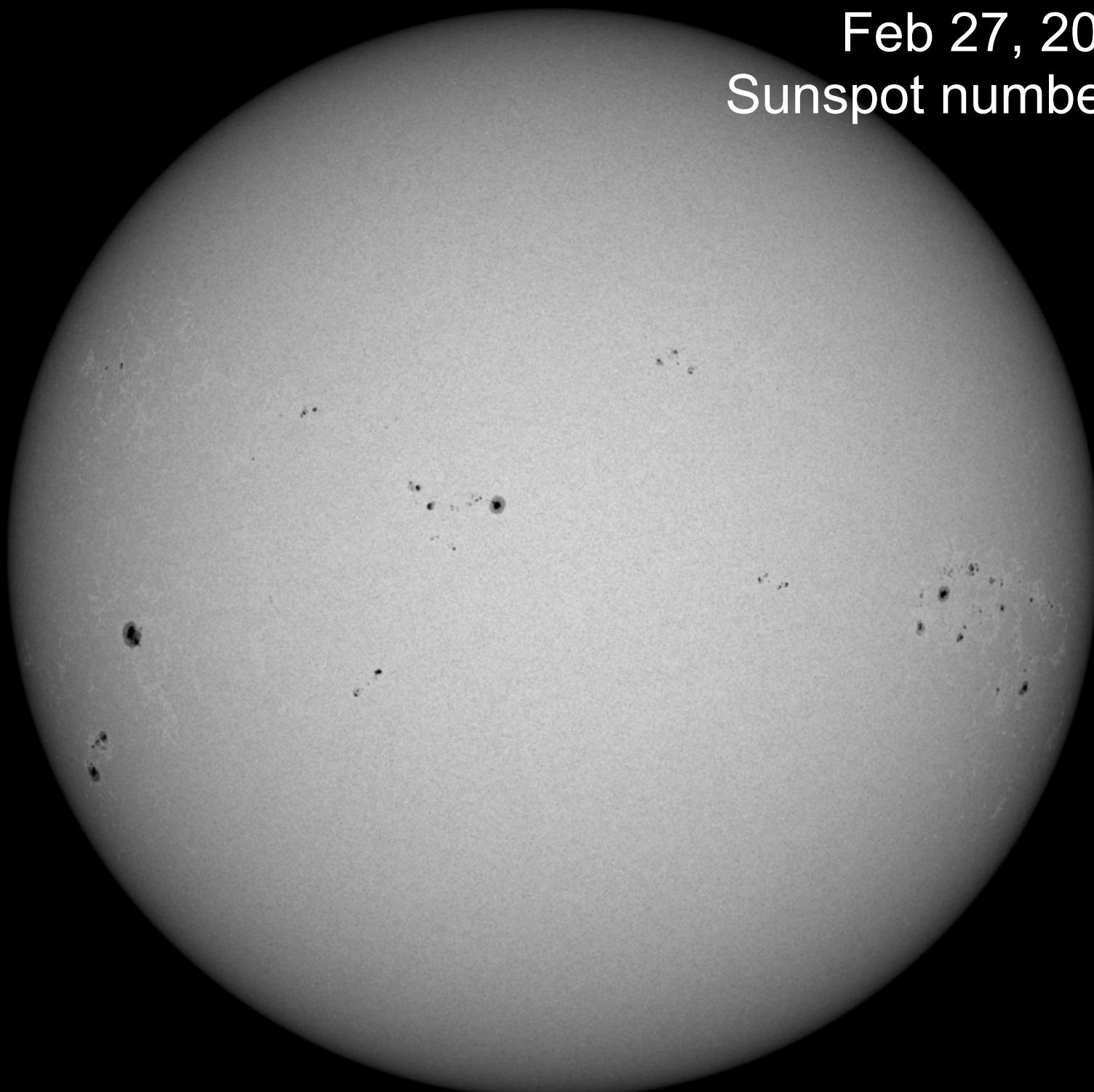
Sunspot numbers : 2008 – 2015

Feb 27, 2014
Maximum = 154

Sunspot number

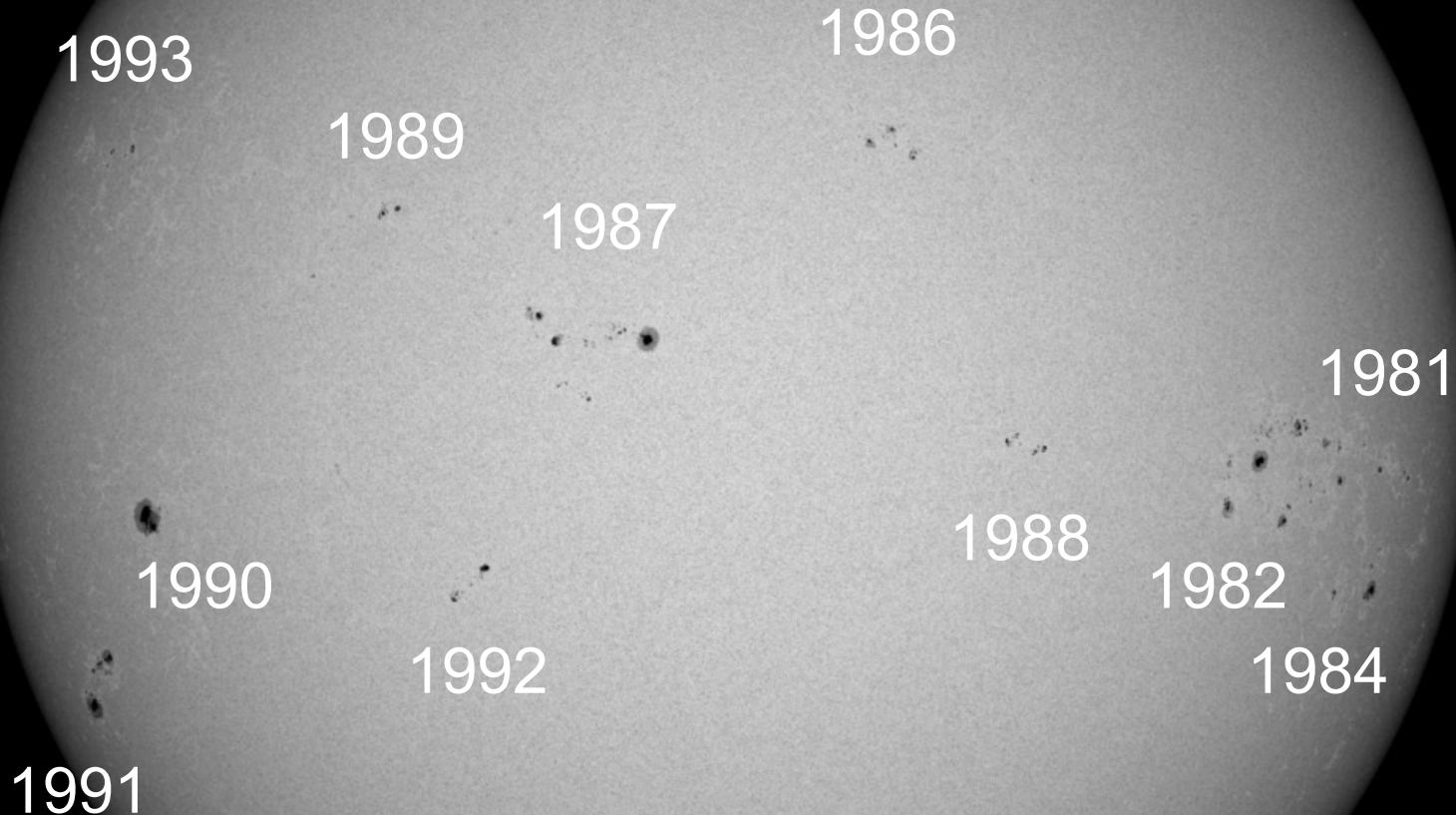


Feb 27, 2014
Sunspot number = 154



SDO

Feb 27, 2014
Sunspot number = 154

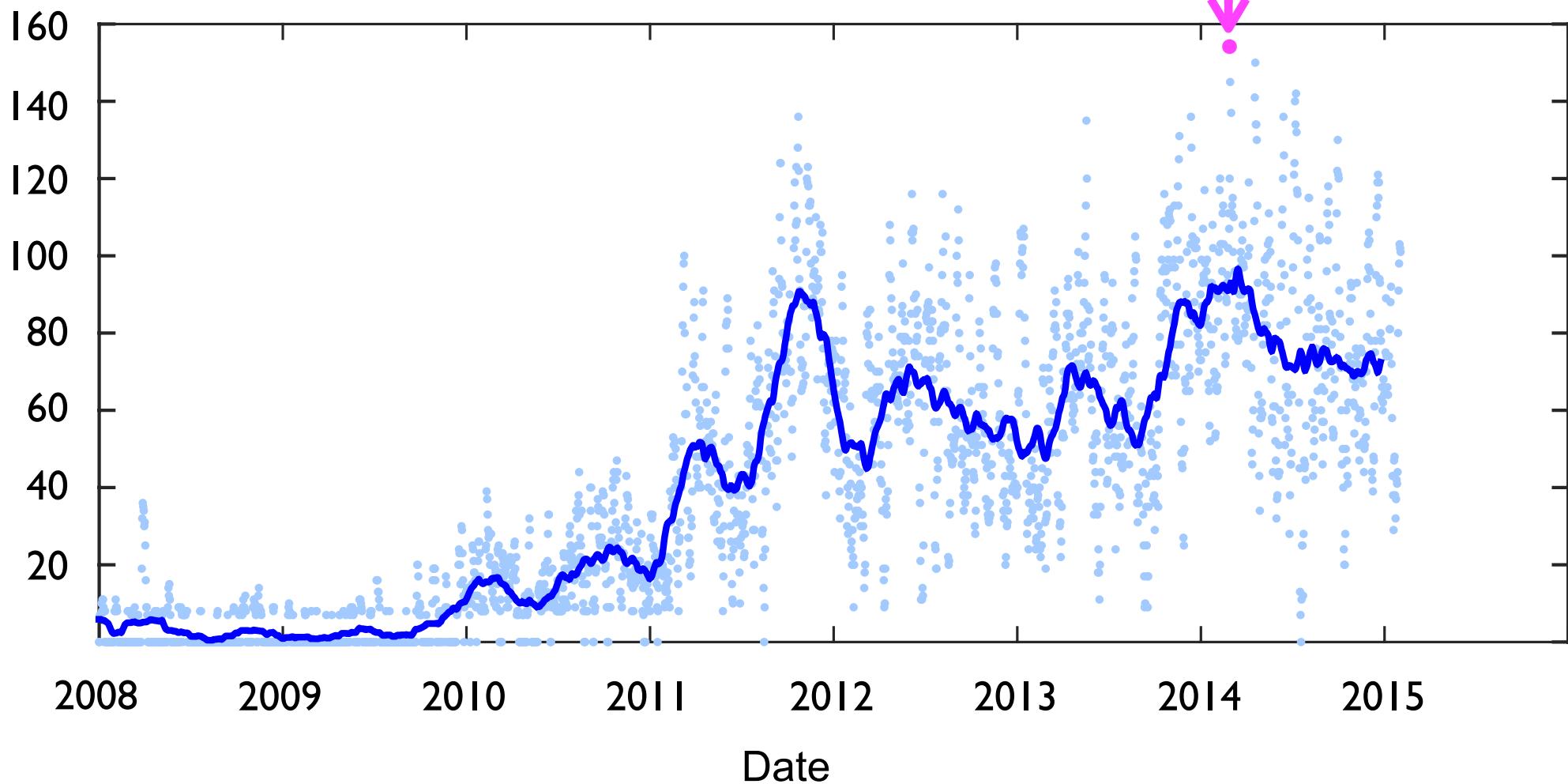


SDO

Sunspot numbers : 2008 – 2015

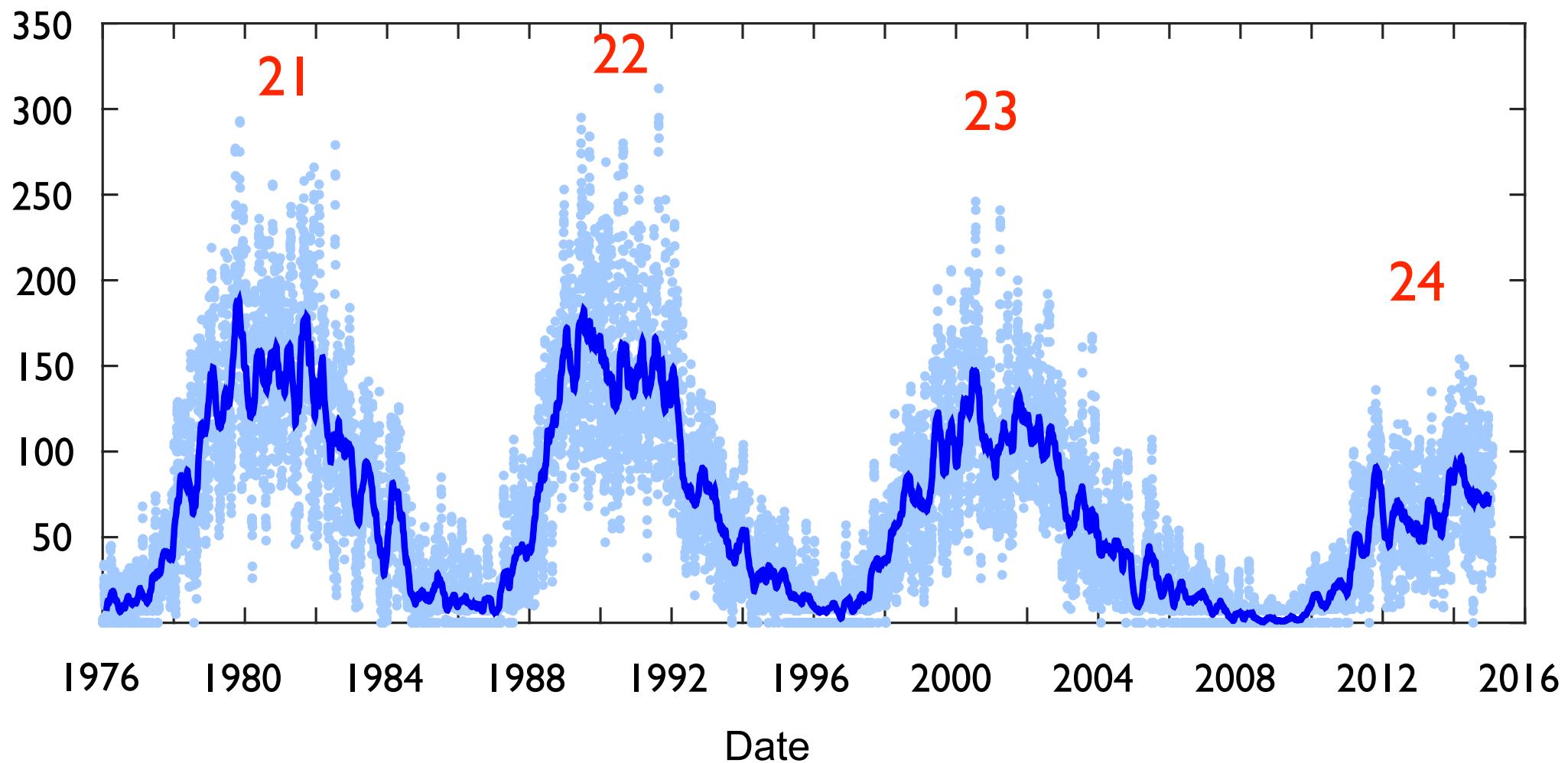
Feb 27, 2014
Maximum = 154

Sunspot number



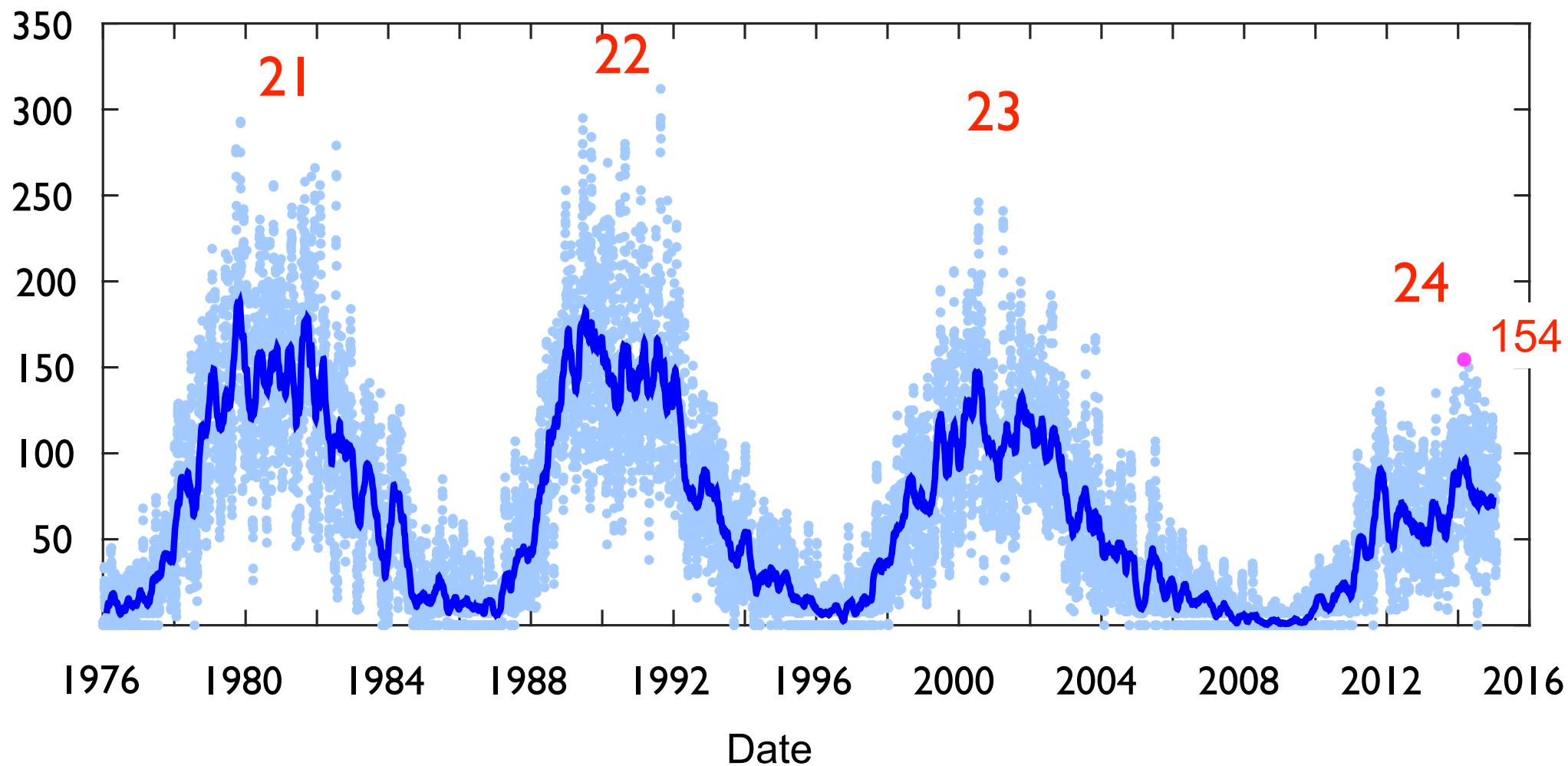
Sunspot numbers : 2008 – 2015

Sunspot number



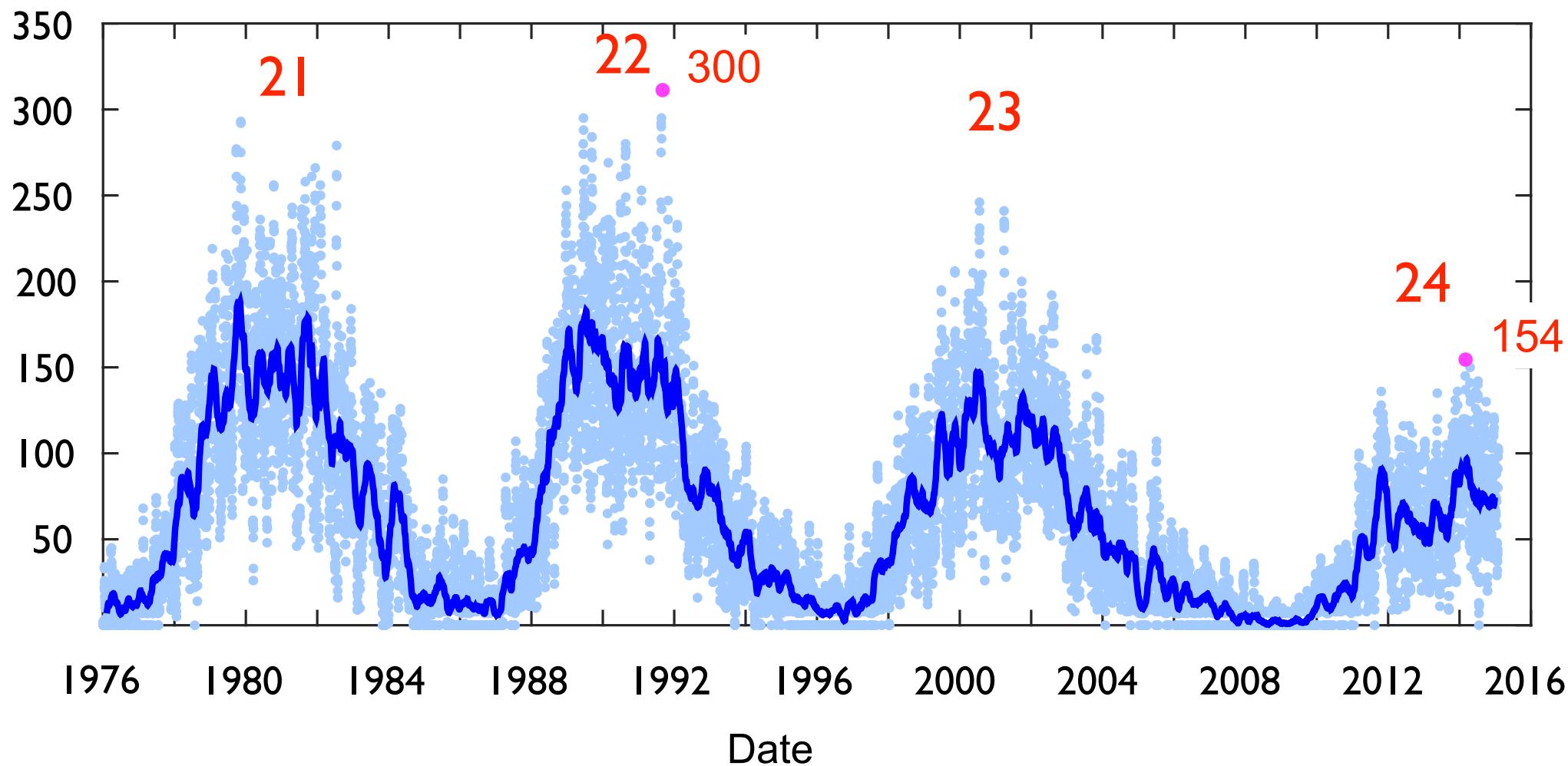
Sunspot numbers : 2008 – 2015

Sunspot number



Sunspot numbers : 2008 – 2015

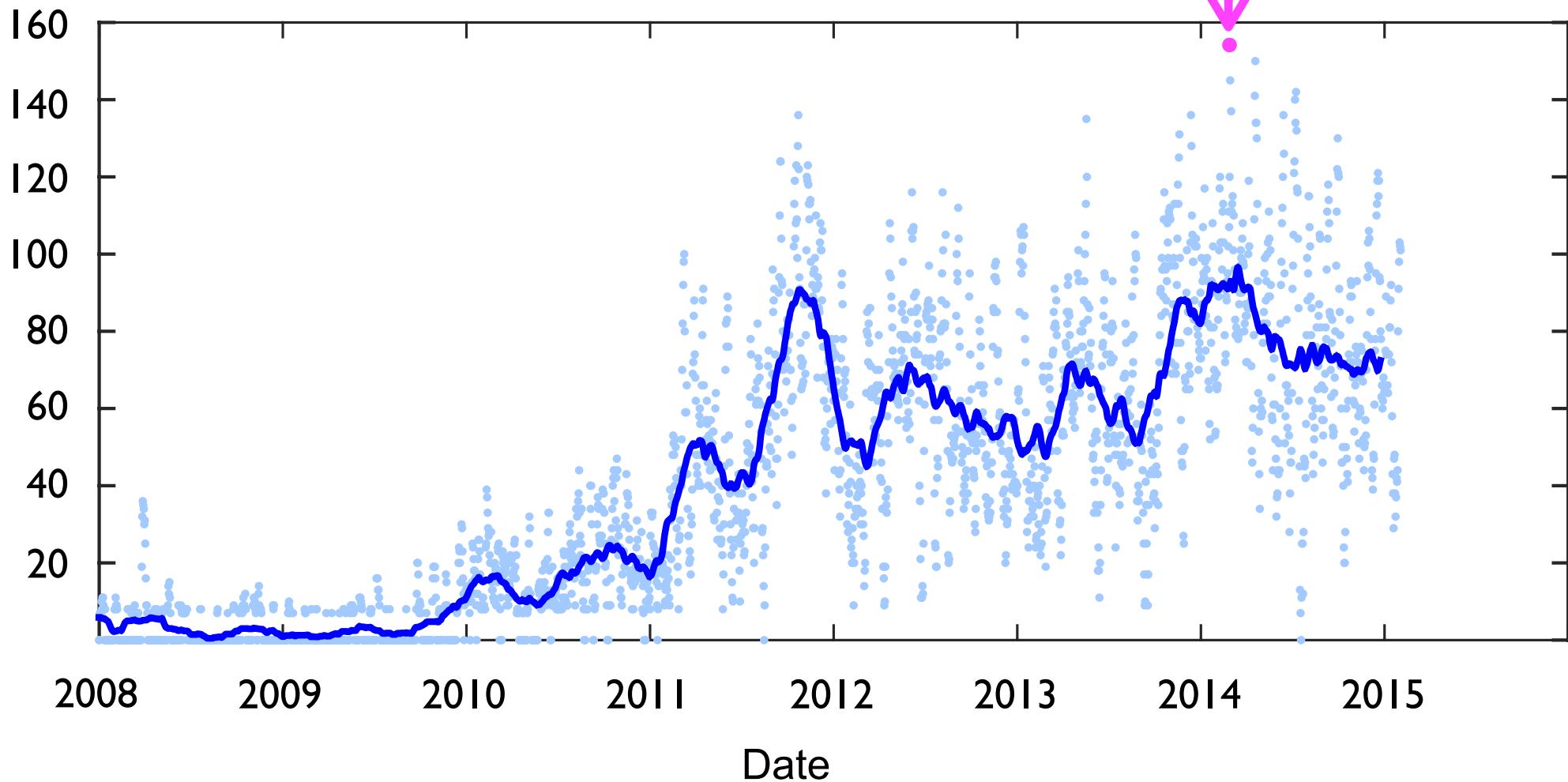
Sunspot number



Sunspot numbers : 2008 – 2015

Feb 27, 2014
Maximum = 154

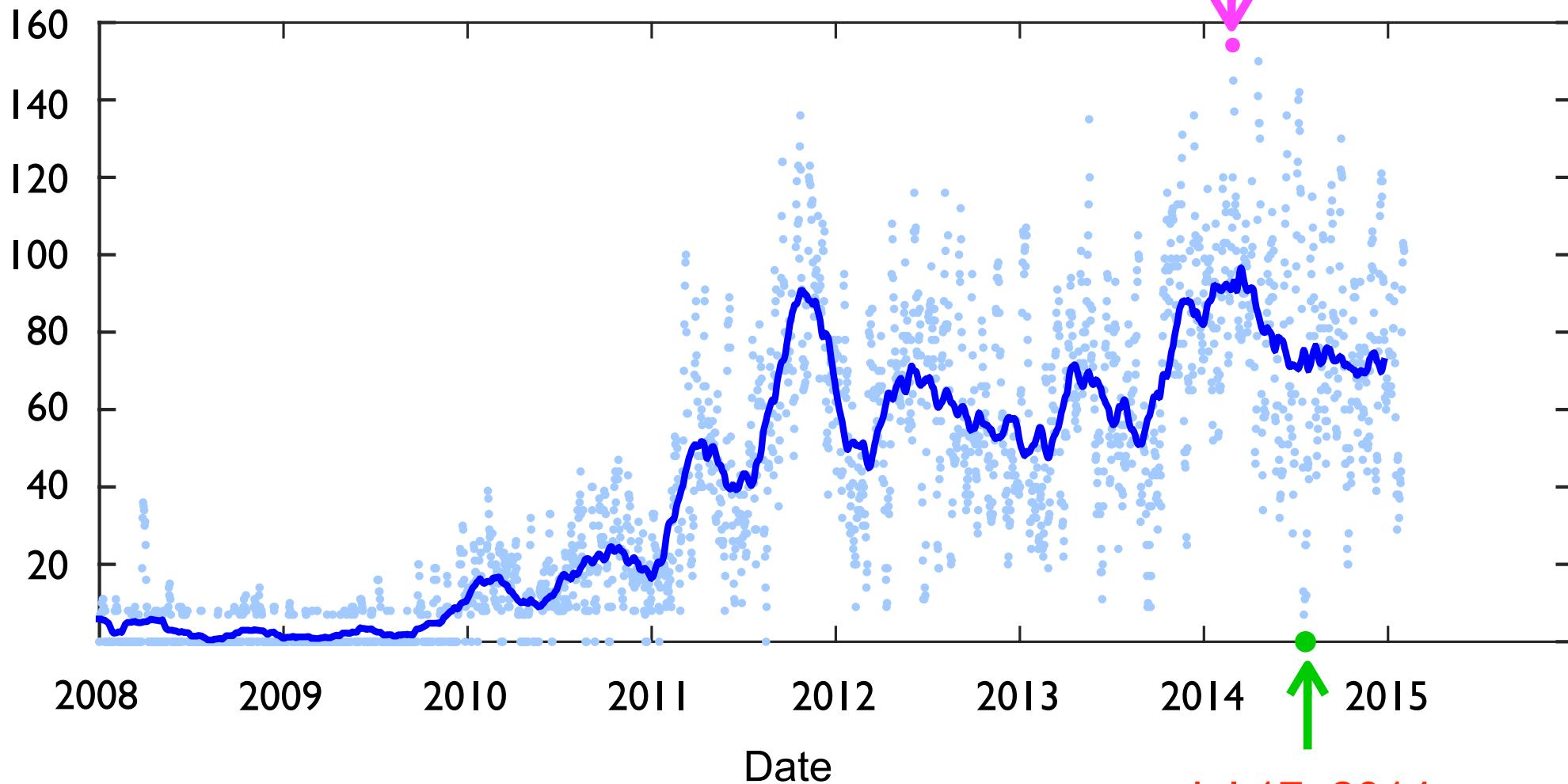
Sunspot number



Sunspot numbers : 2008 – 2015

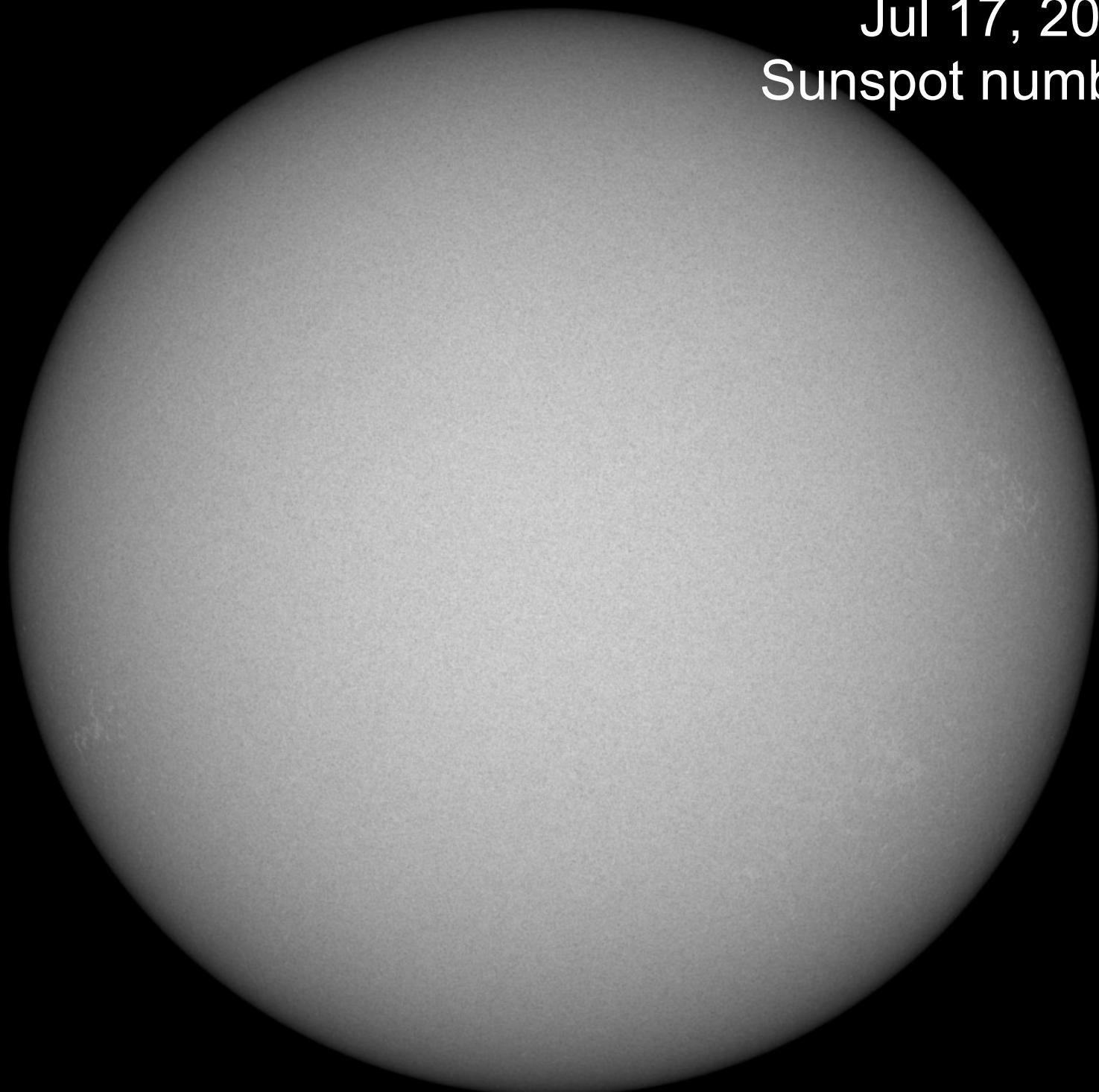
Feb 27, 2014
Maximum = 154

Sunspot number



Jul 17, 2014
Minimum = 0

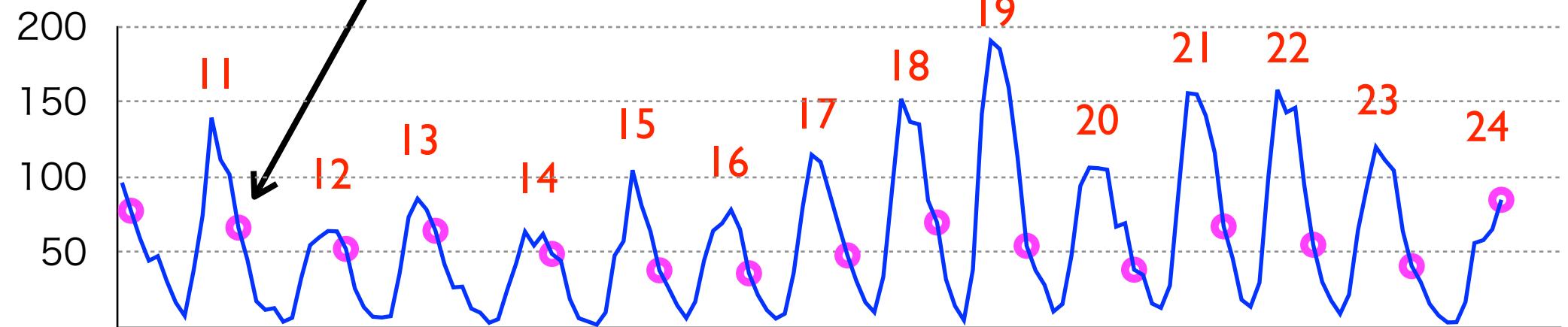
Jul 17, 2014
Sunspot number = 0



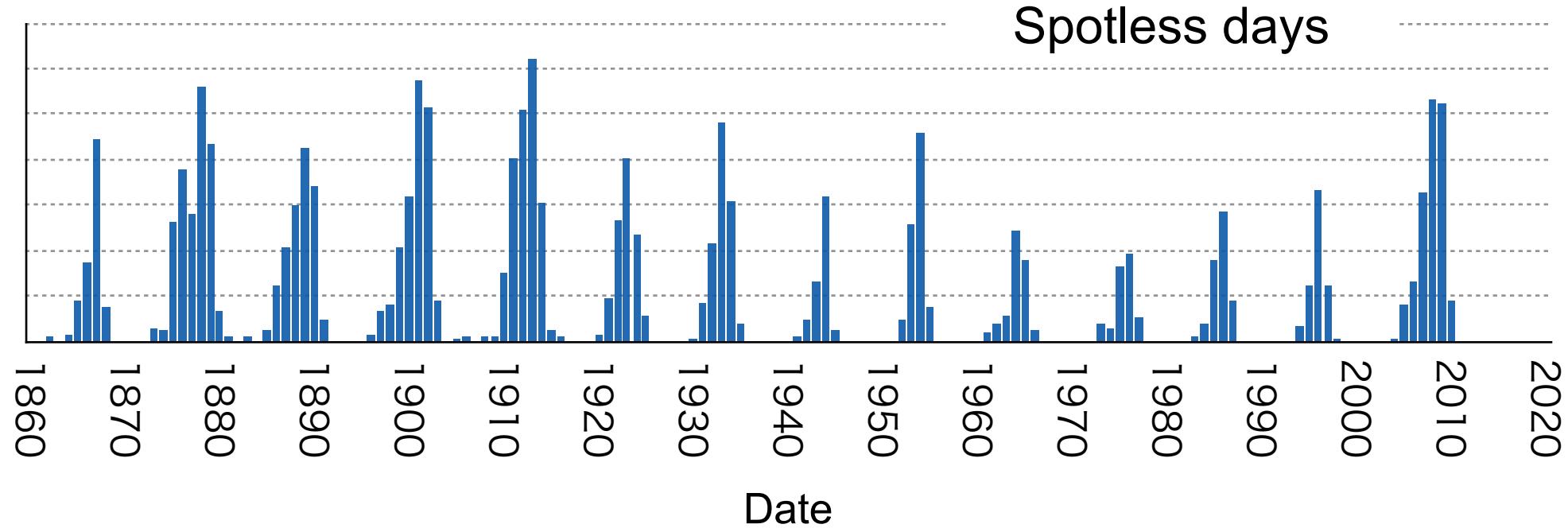
SDO

First spotless day

Solar cycle

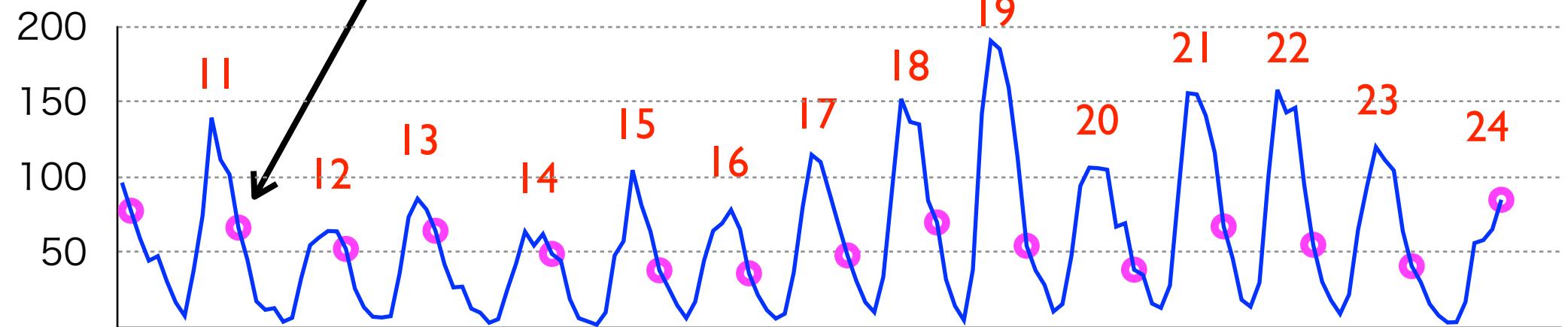


Spotless days

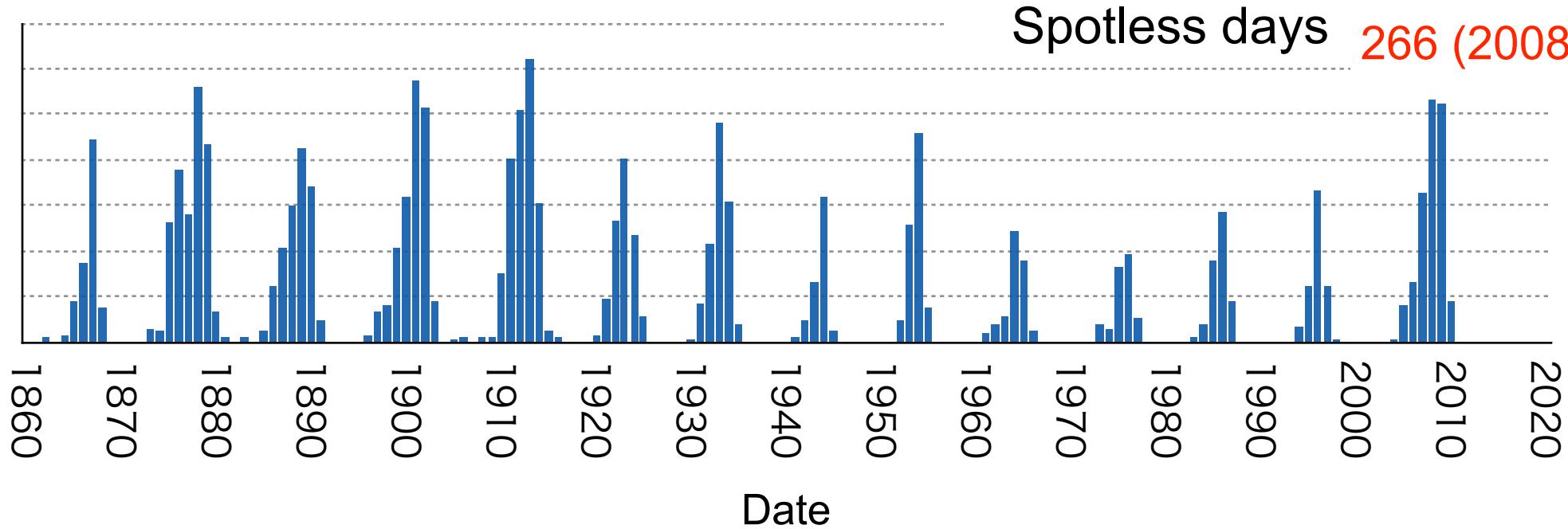


First spotless day

Solar cycle

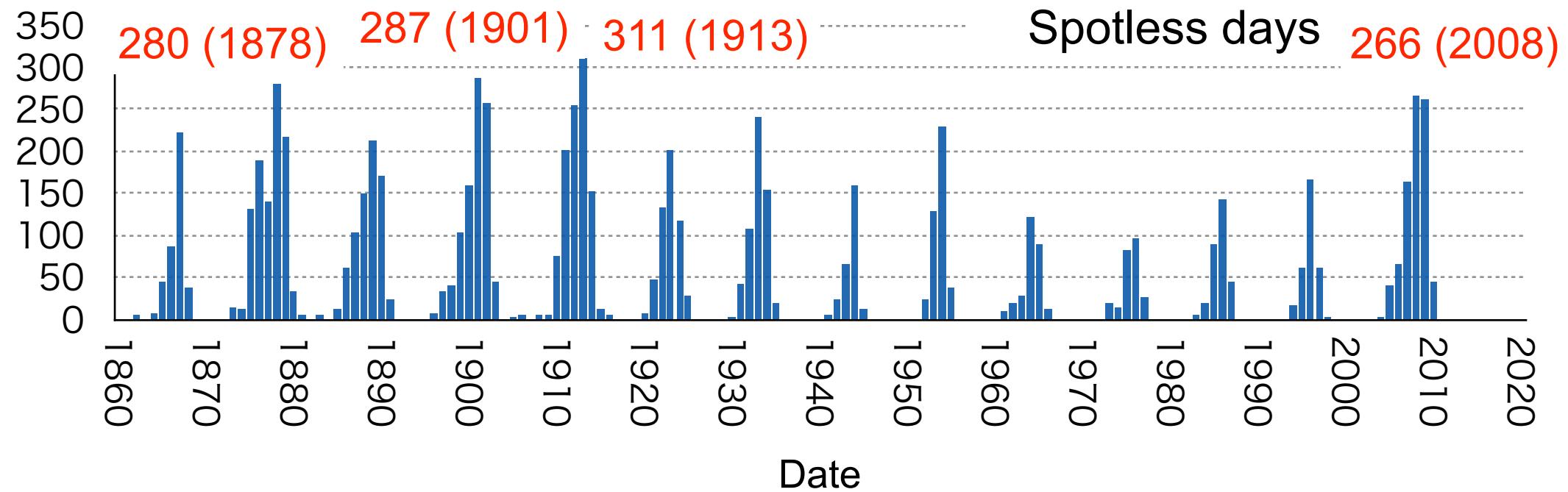
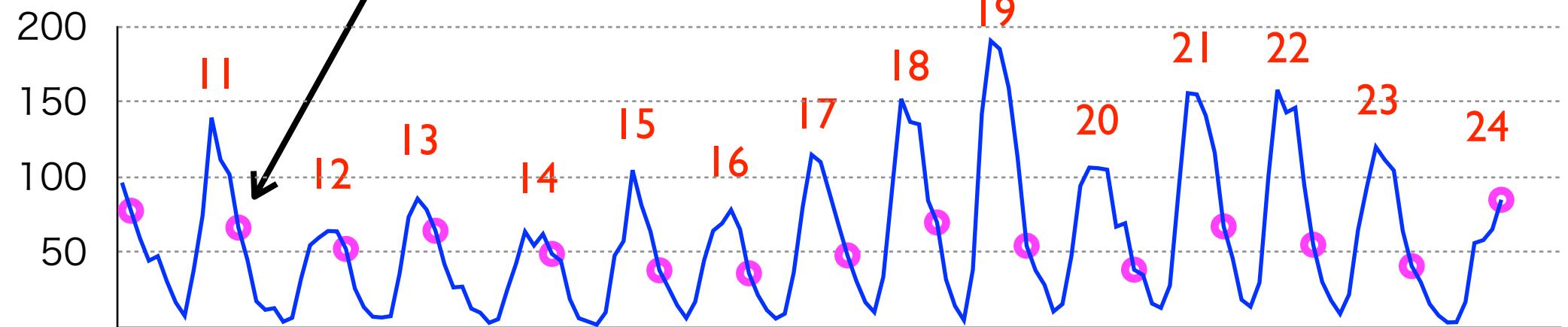


Spotless days 266 (2008)



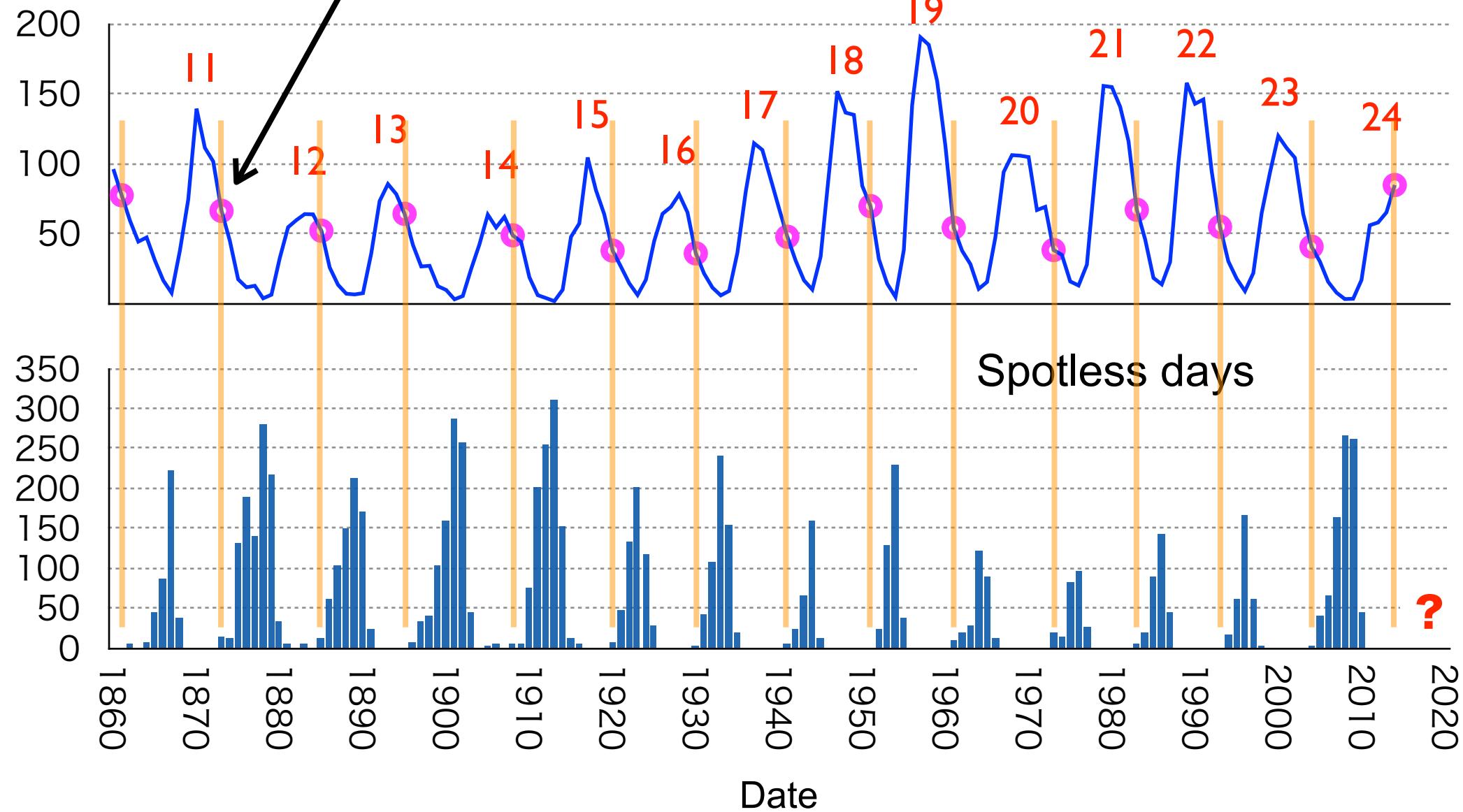
First spotless day

Solar cycle



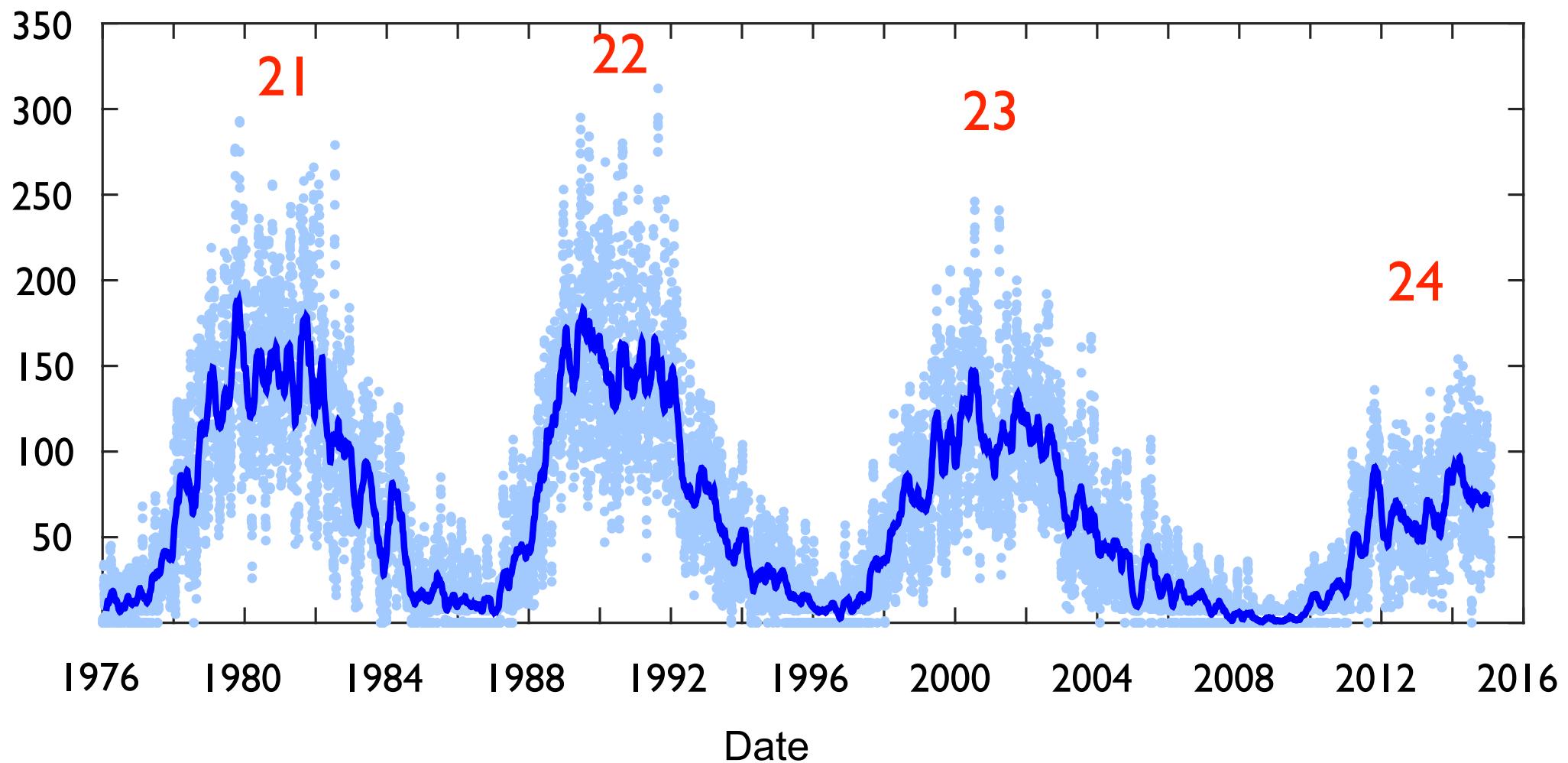
First spotless day

Solar cycle



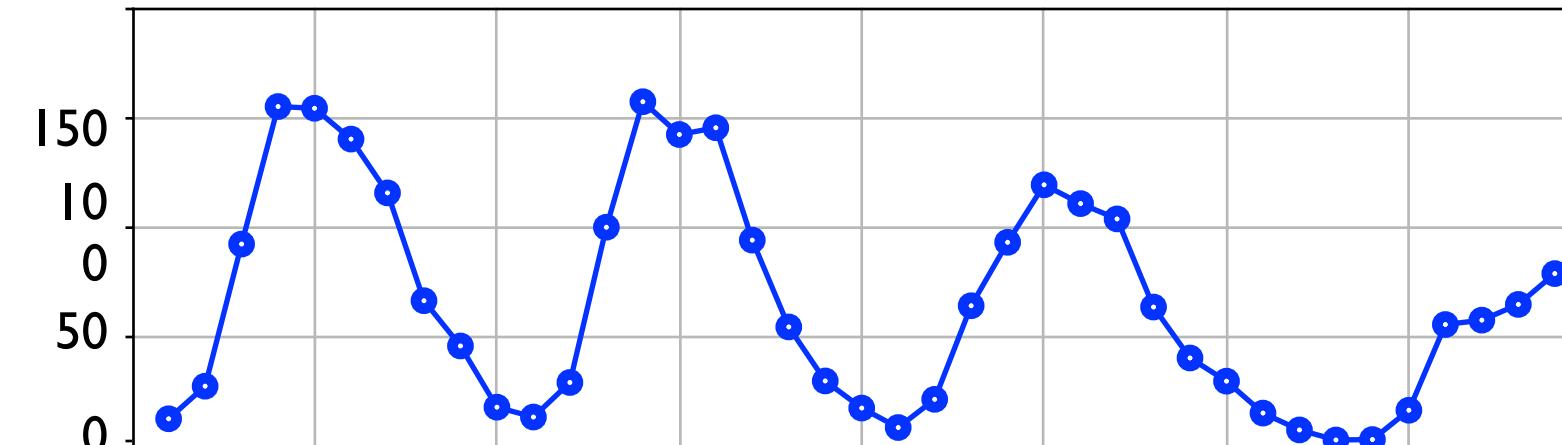
Sunspot numbers : 2008 – 2015

Sunspot number



Sunspot numbers and solar flares

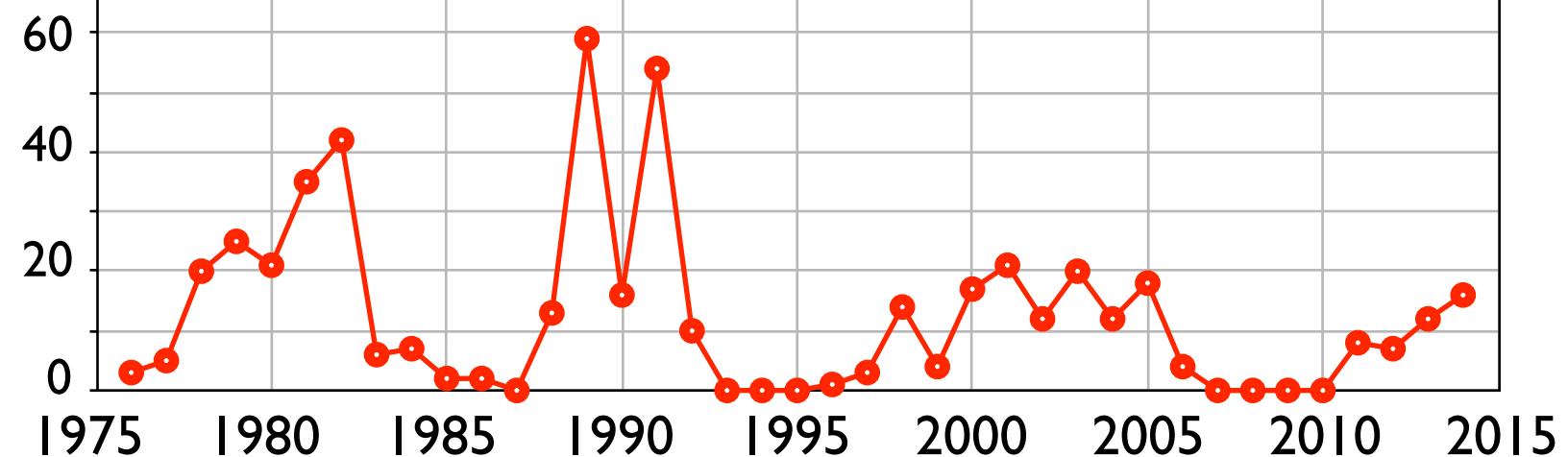
Sunspot number



C,M,X -class flares

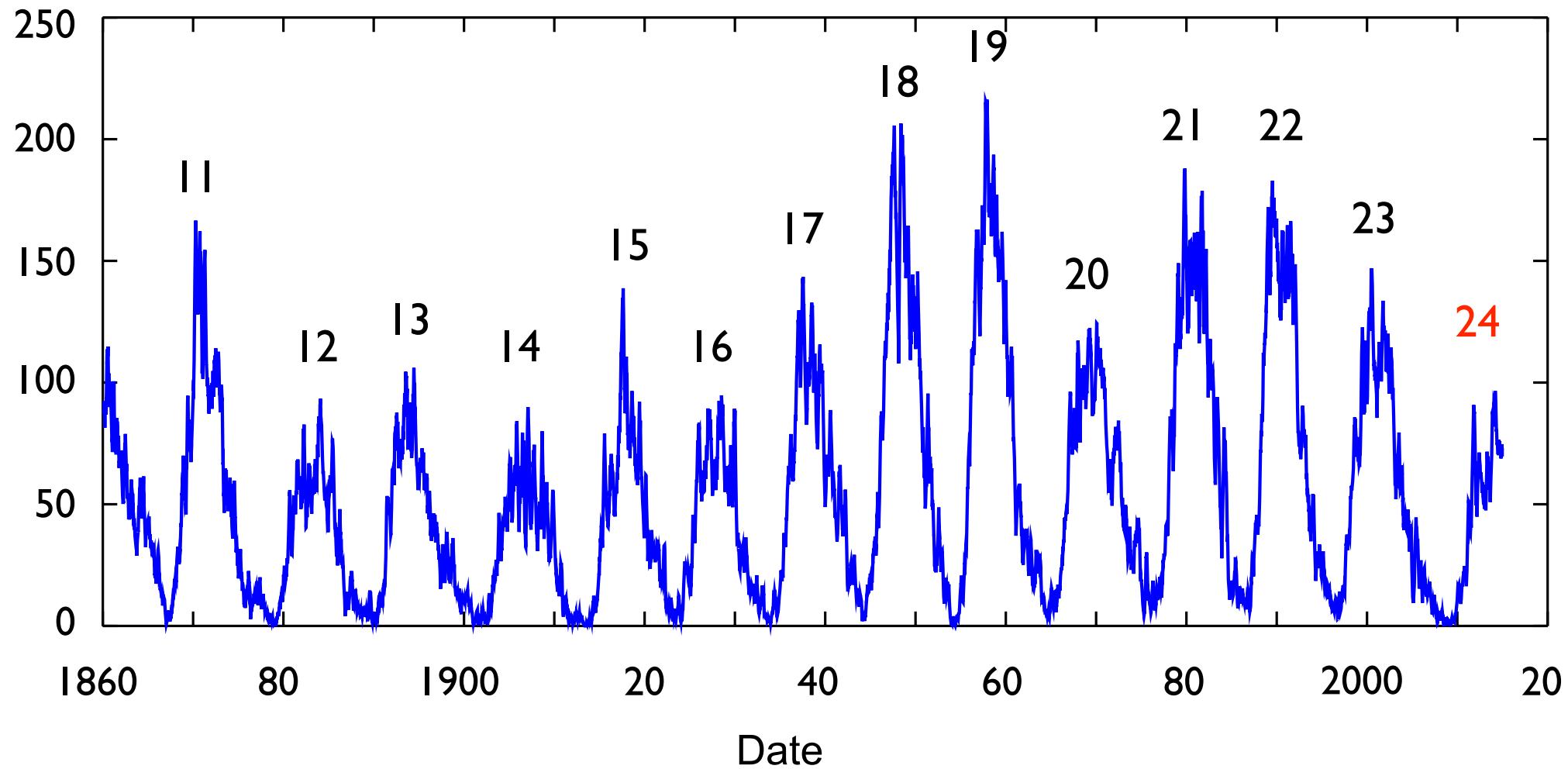


X-class flares



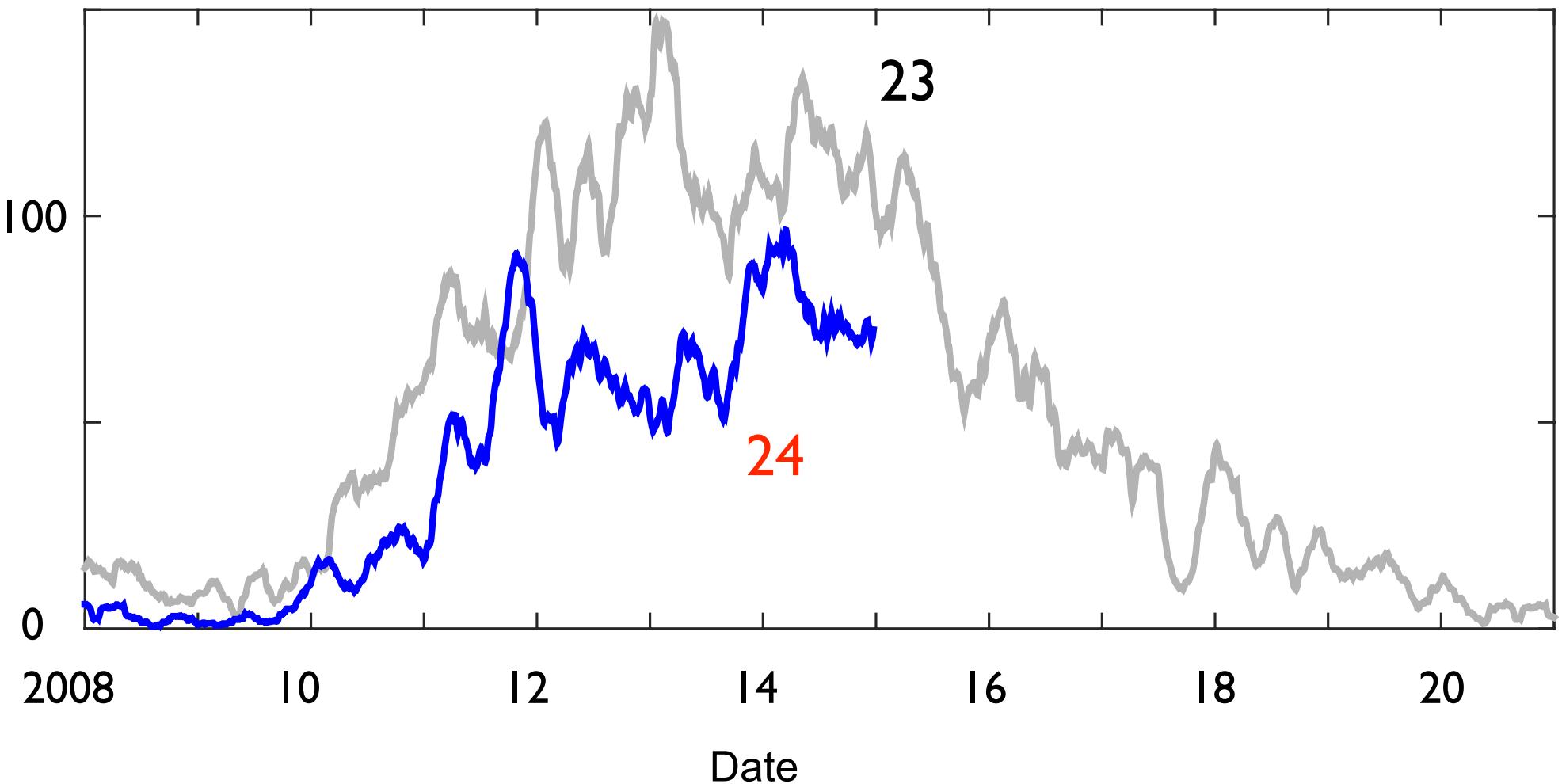
Sunspot numbers : 1860 – 2015

Sunspot number



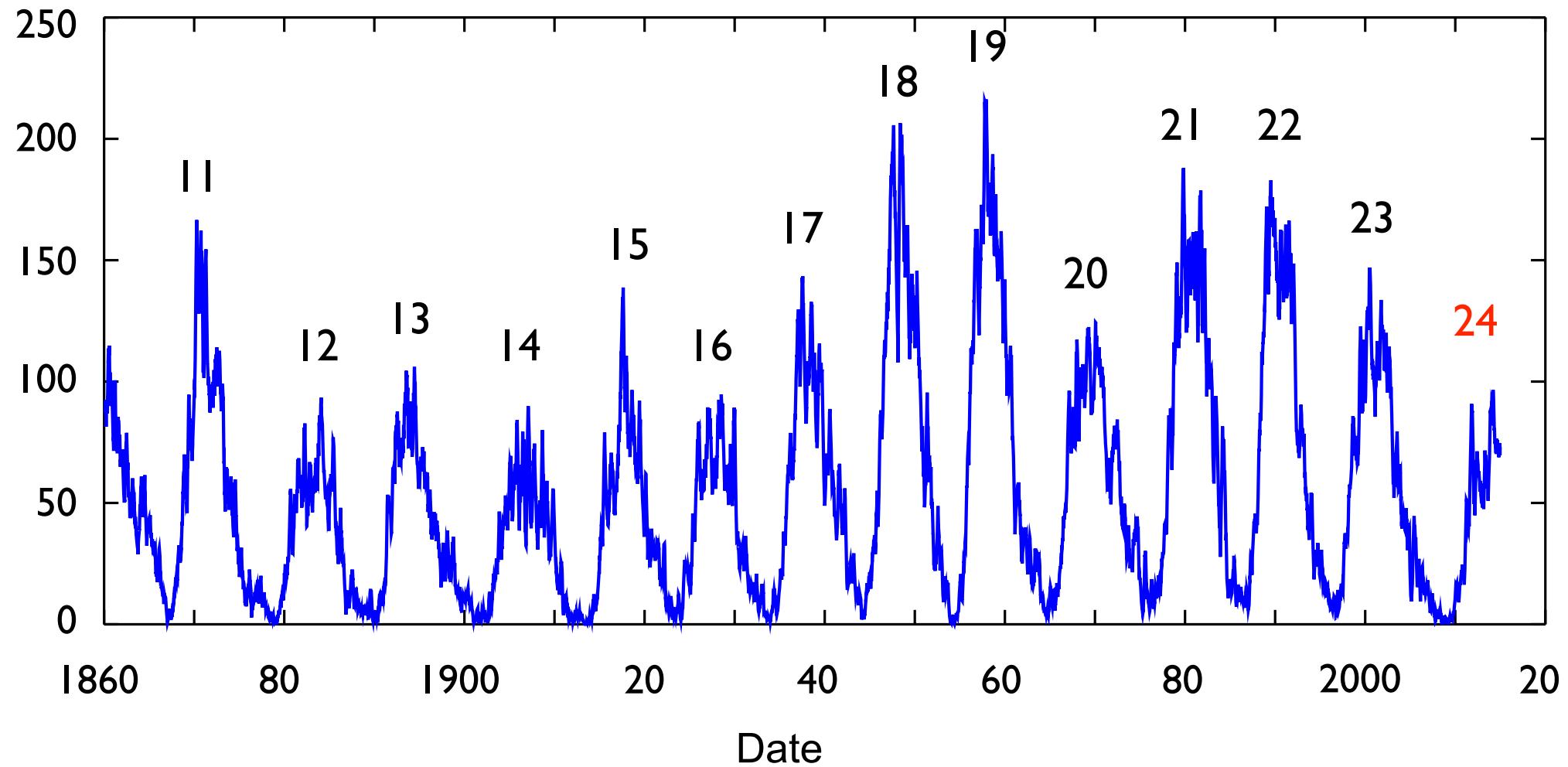
Solar cycle 24 and 23

Sunspot number



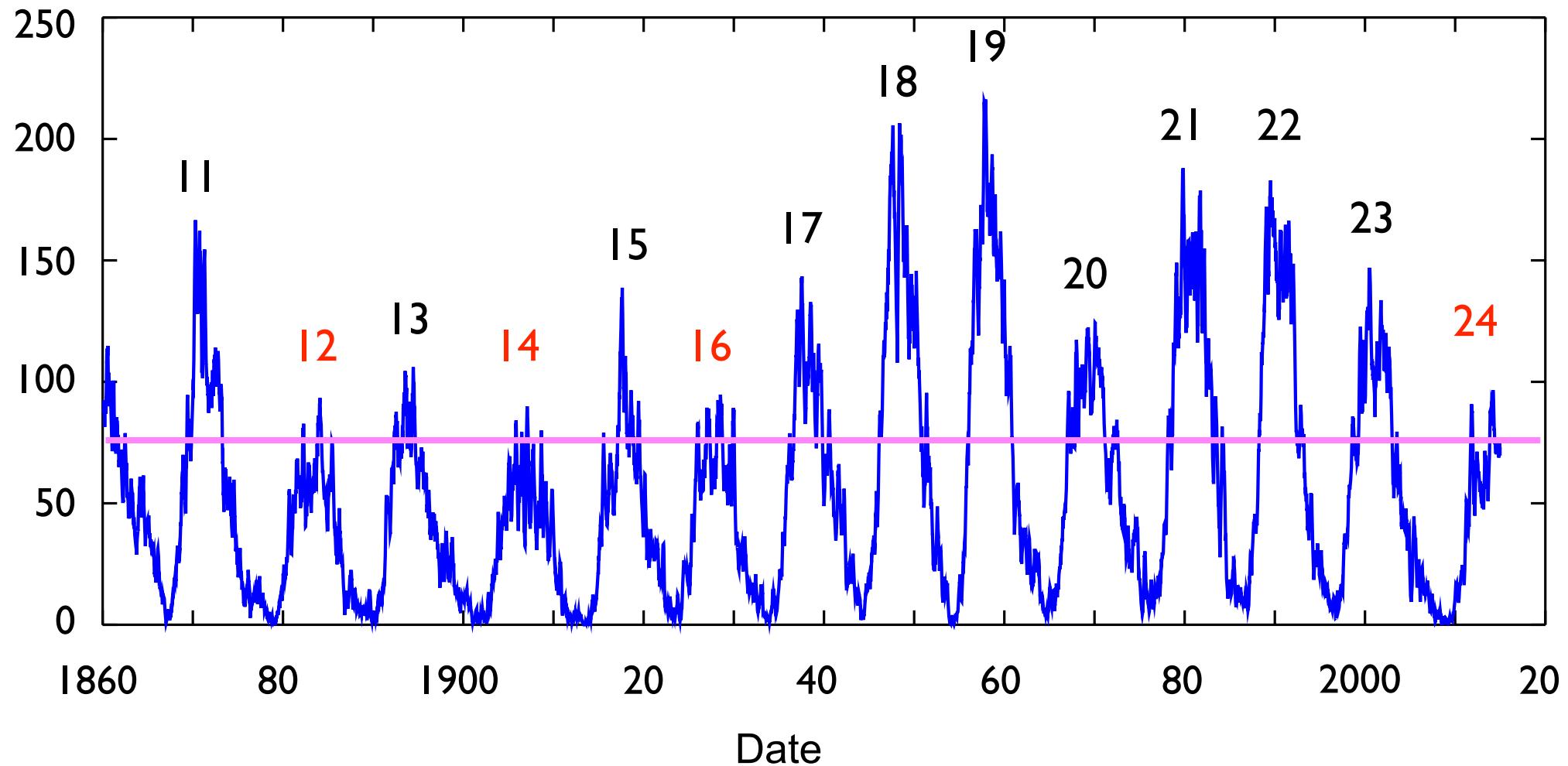
Sunspot numbers : 1860 – 2015

Sunspot number



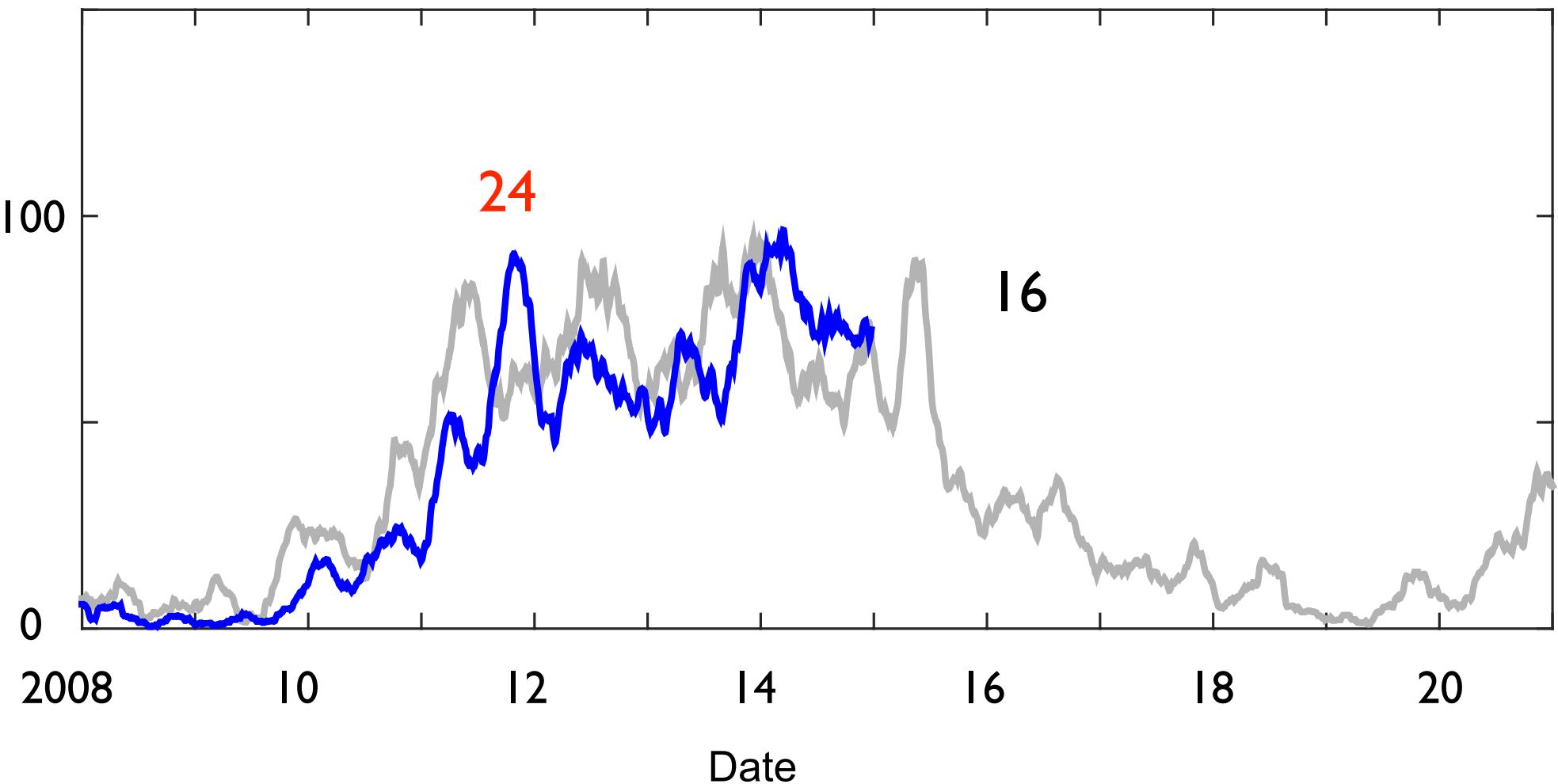
Sunspot numbers : 1860 – 2015

Sunspot number



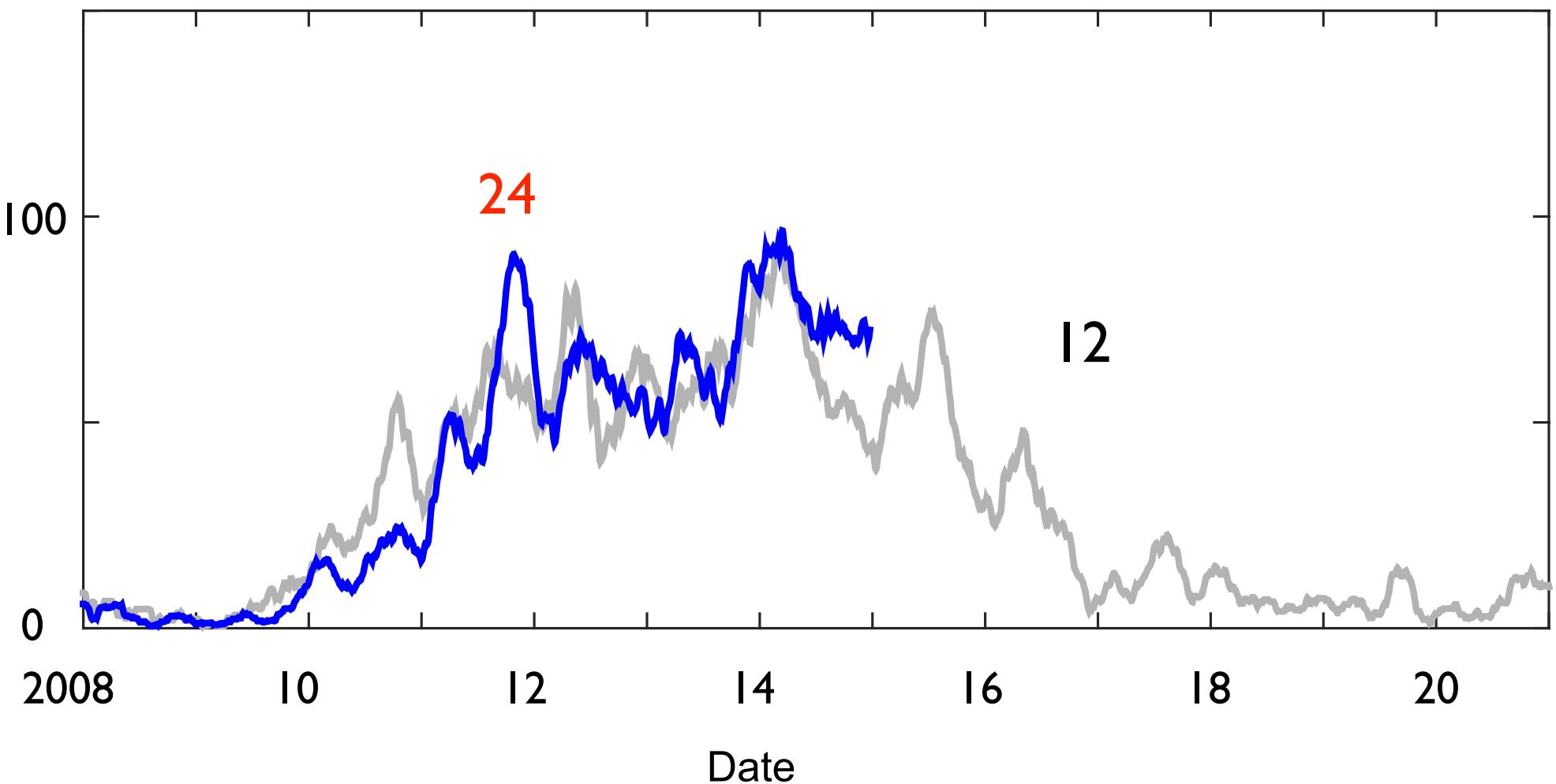
Solar cycle 24 and 16

Sunspot number

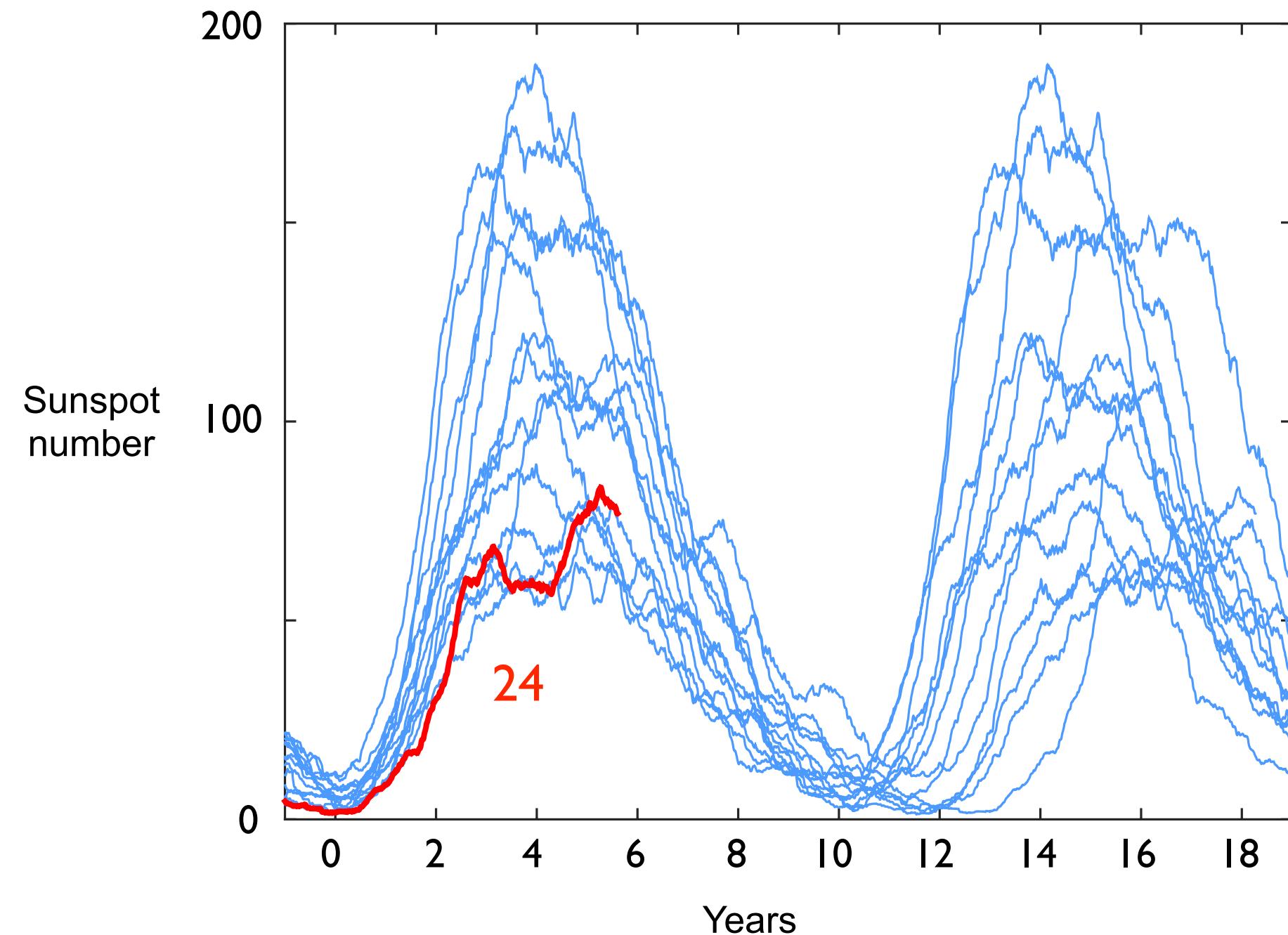


Solar cycle 24 and 12

Sunspot number



Solar cycle 24 and 11–23

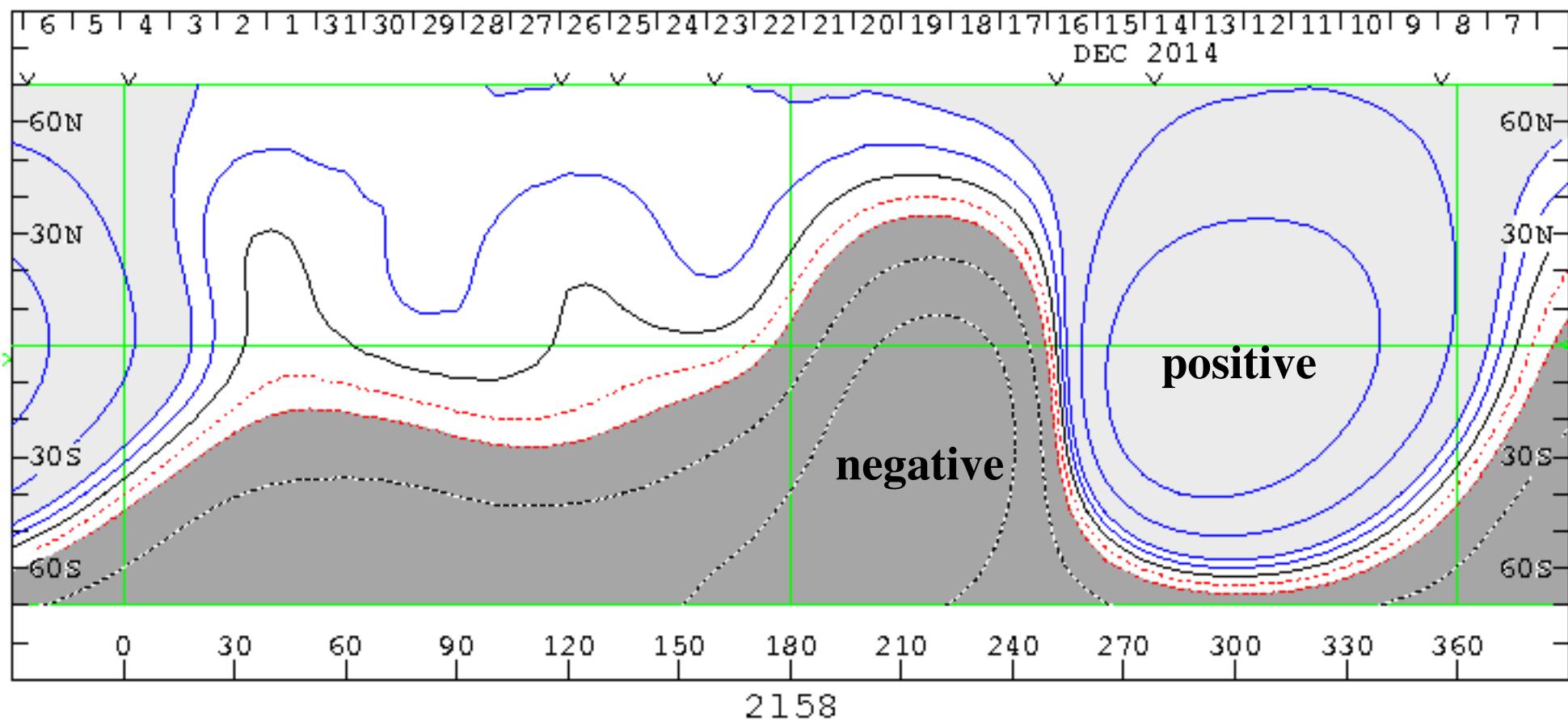


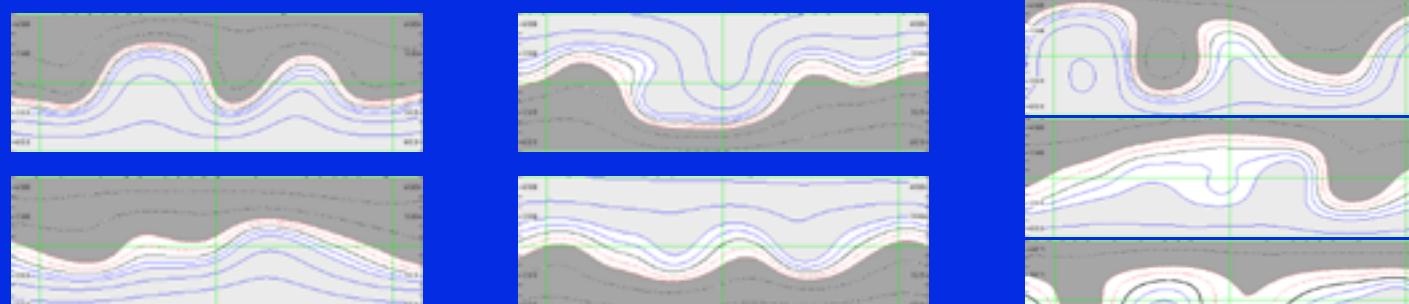
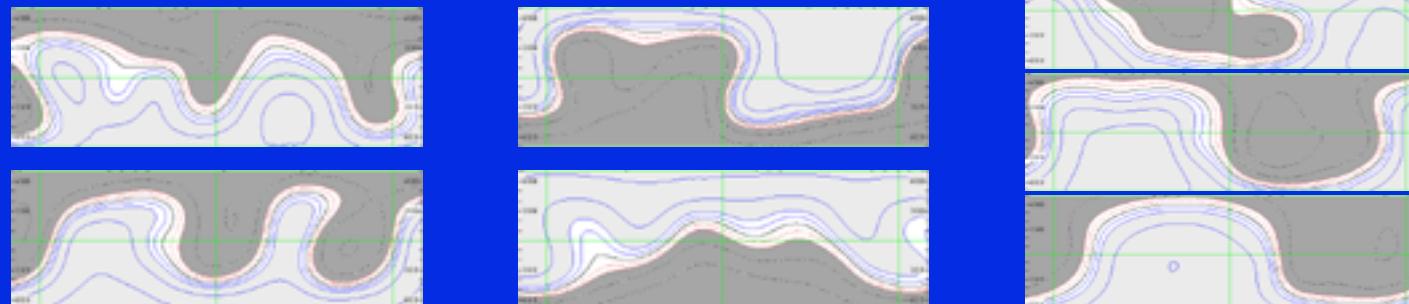
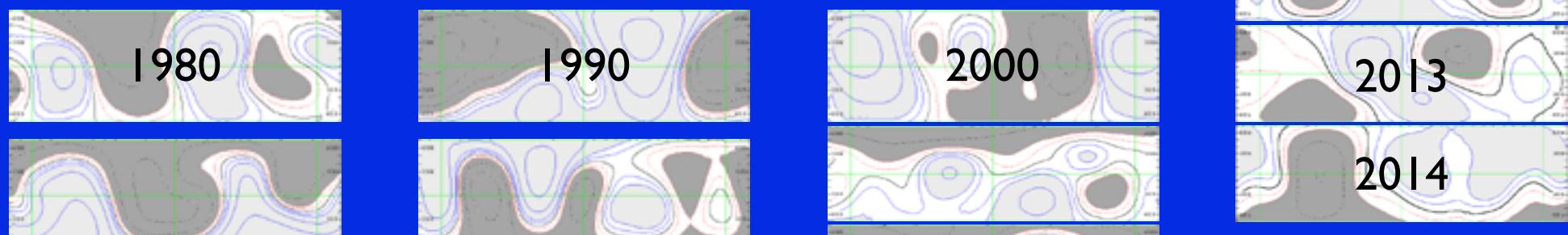
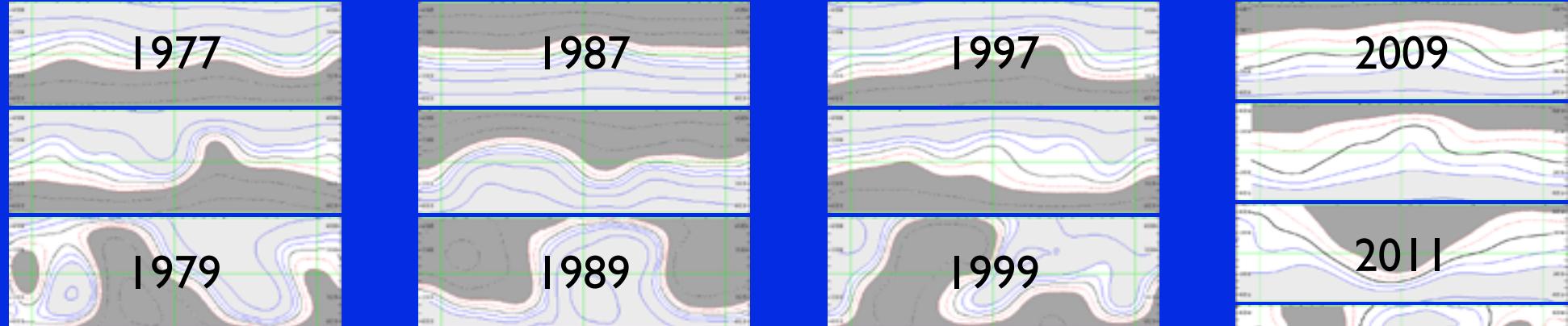
Coronal Magnetic Field Map

Wilcox Solar Observatory

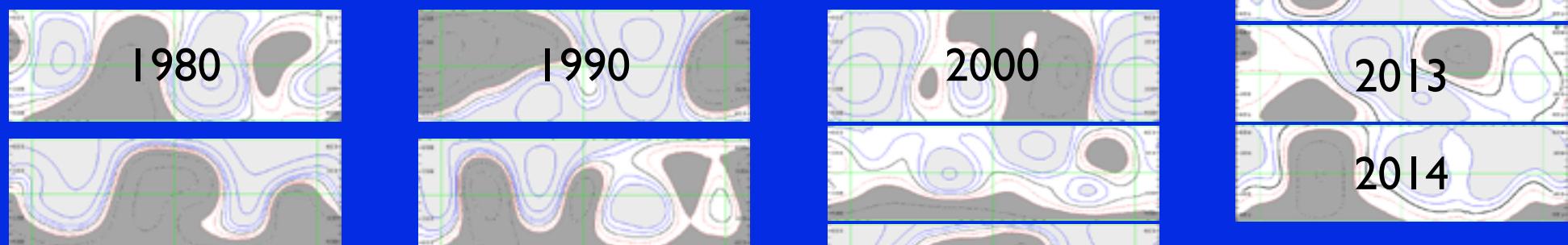
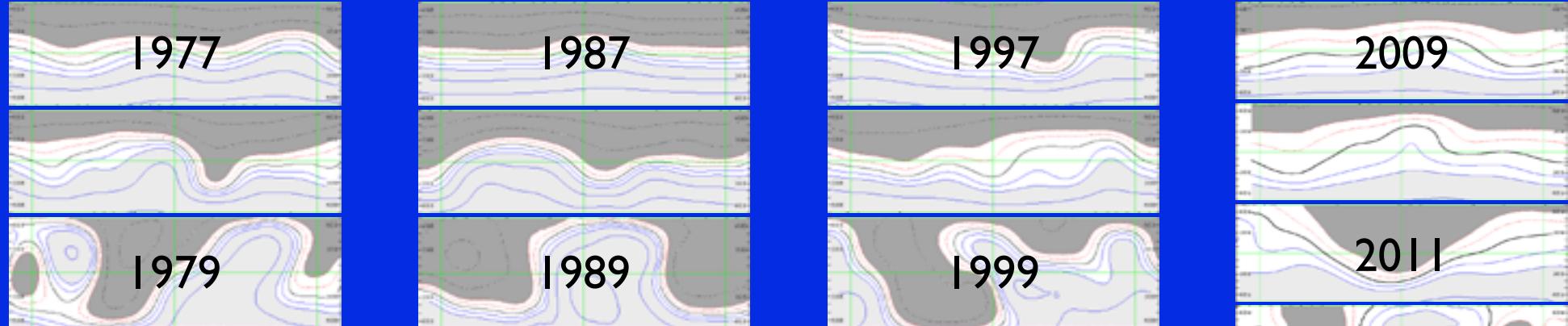
WSO - Source Surface Field

0, ± 1 , 2, 5, 10, 20 MicroTesla

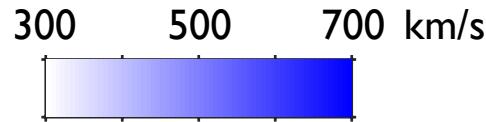




Wilcox



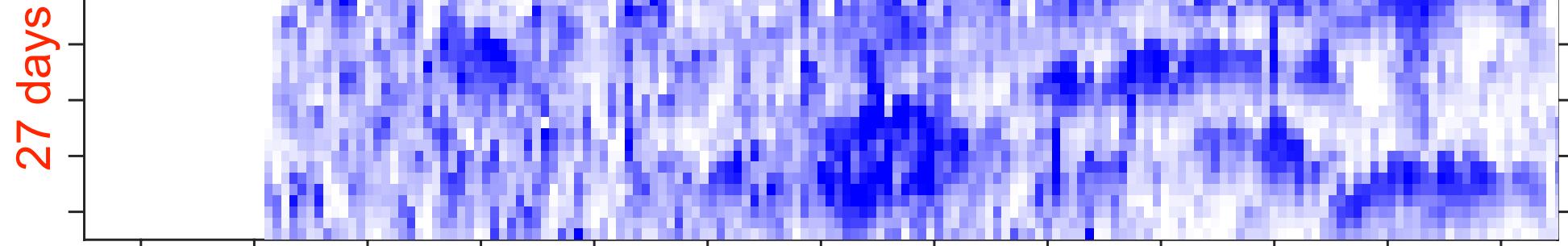
Solar wind velocity



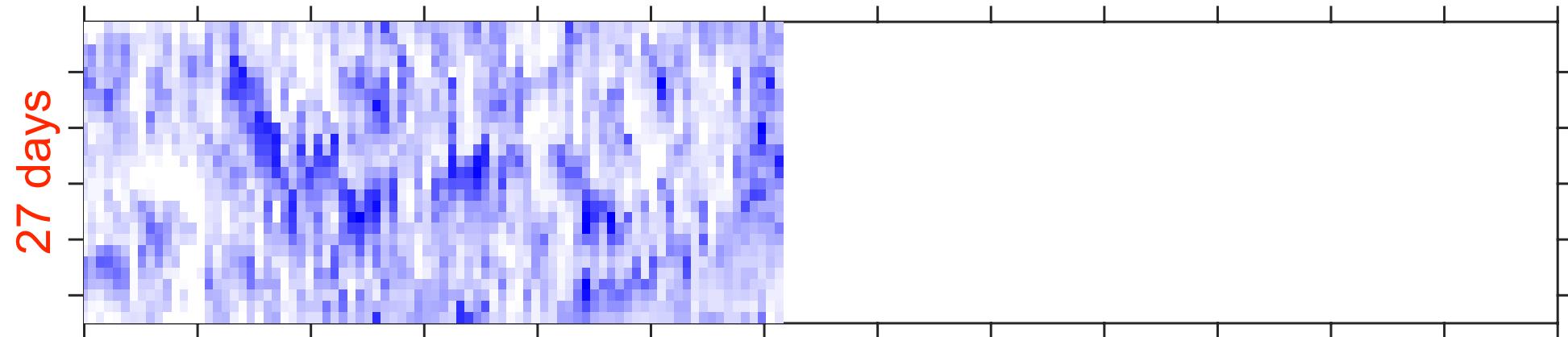
Solar
cycle

1997 98 99 2000 01 02 03 04 05 06 07 08 09

23



24

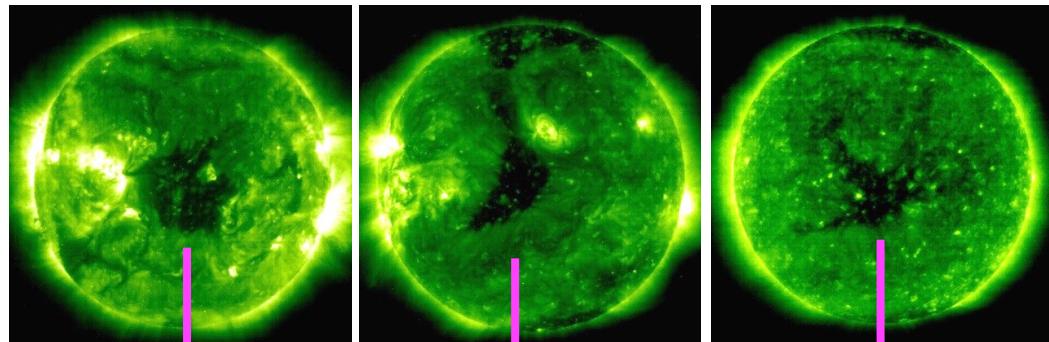
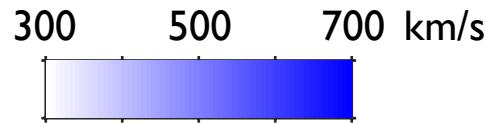


Date

ACE satellite

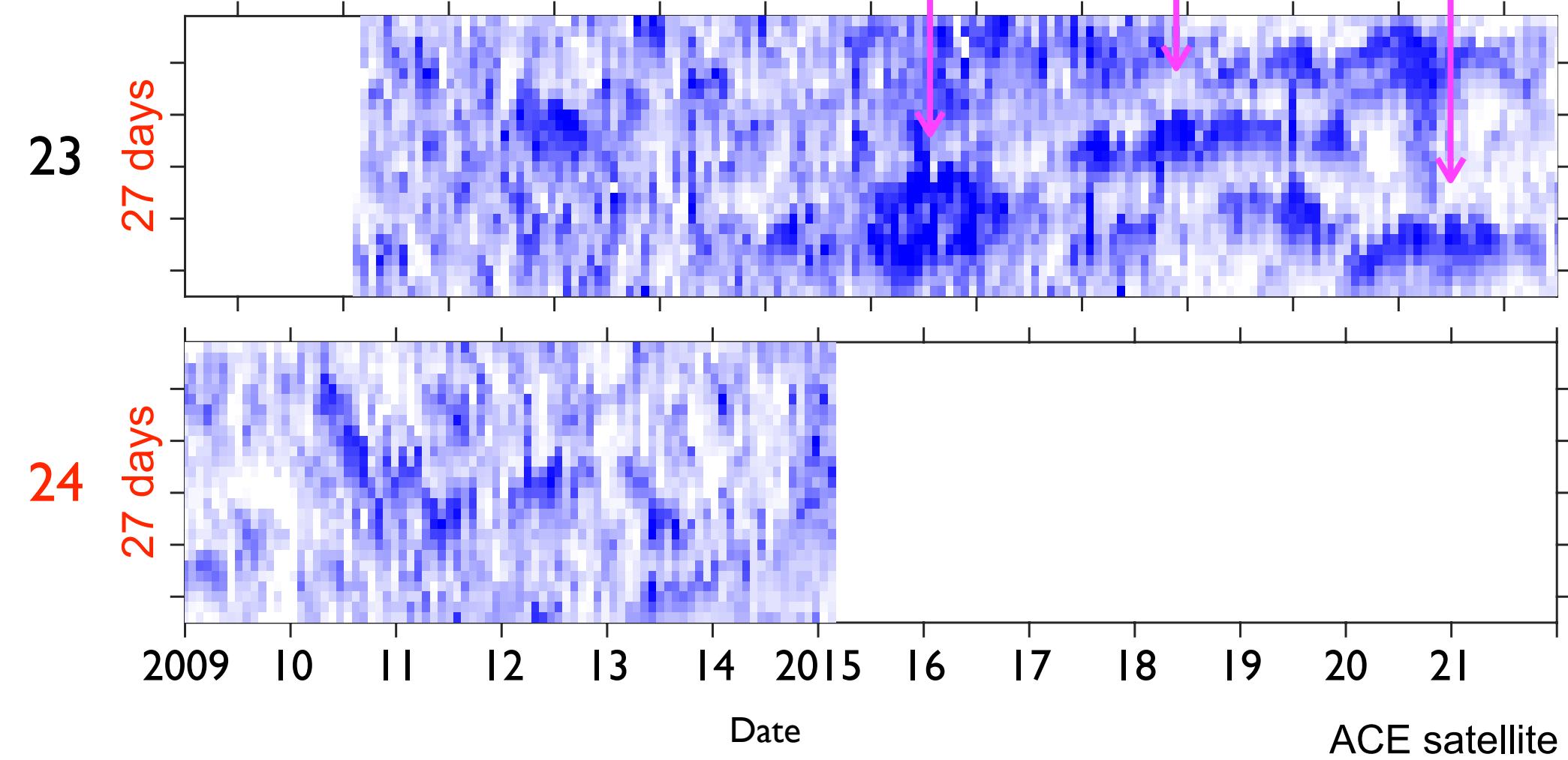
SOHO EIT 195

Solar wind velocity

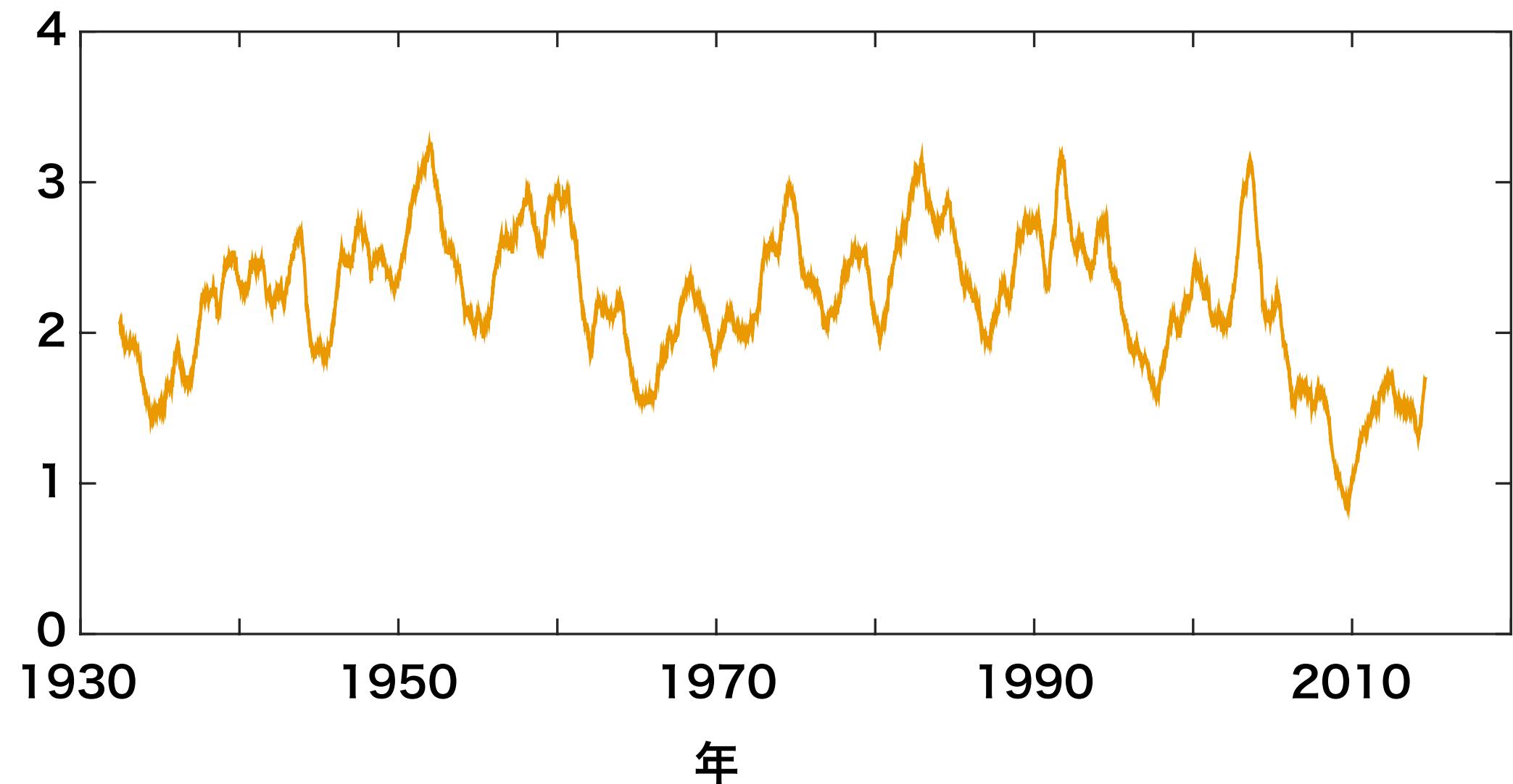


Solar
cycle

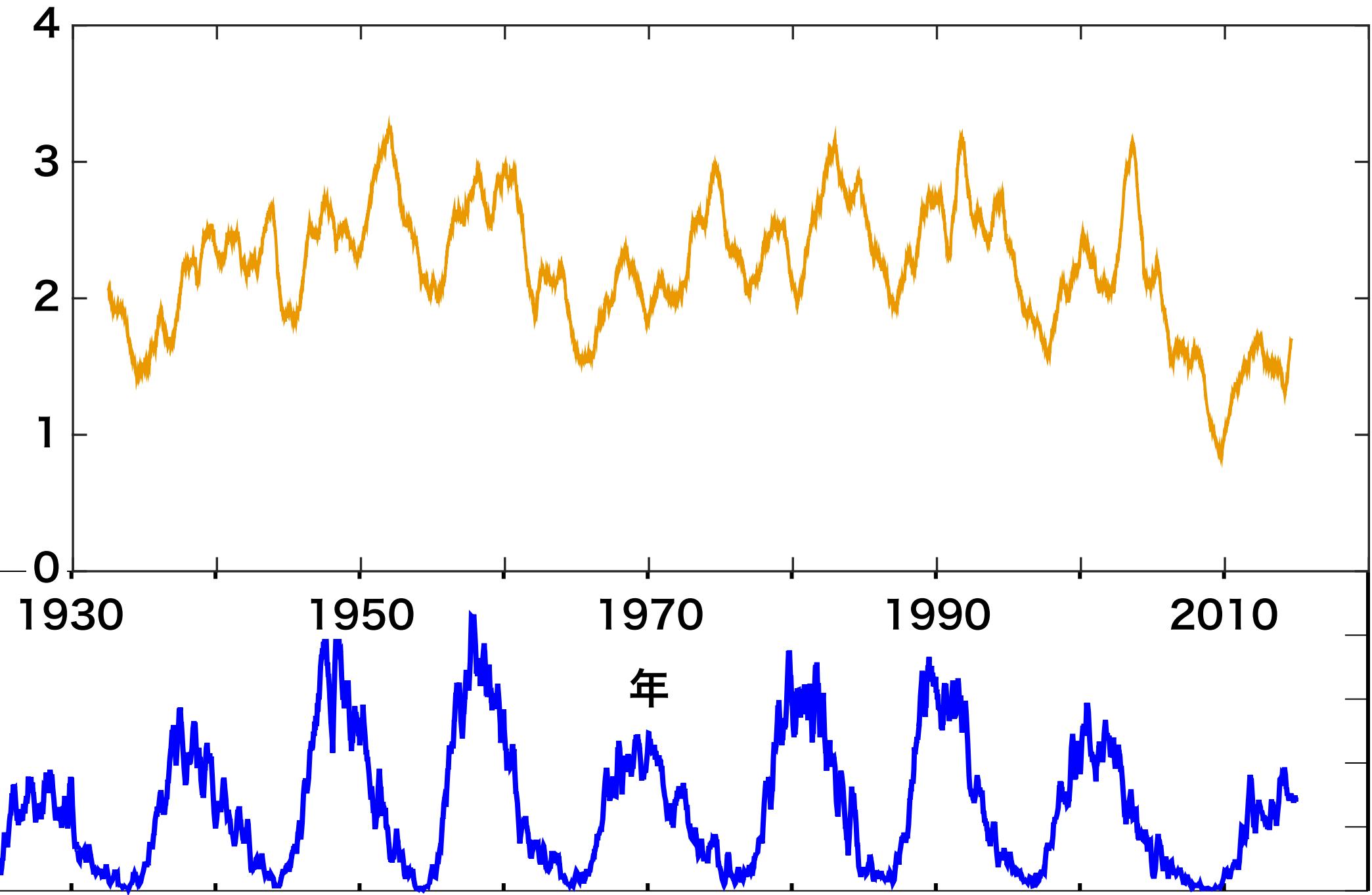
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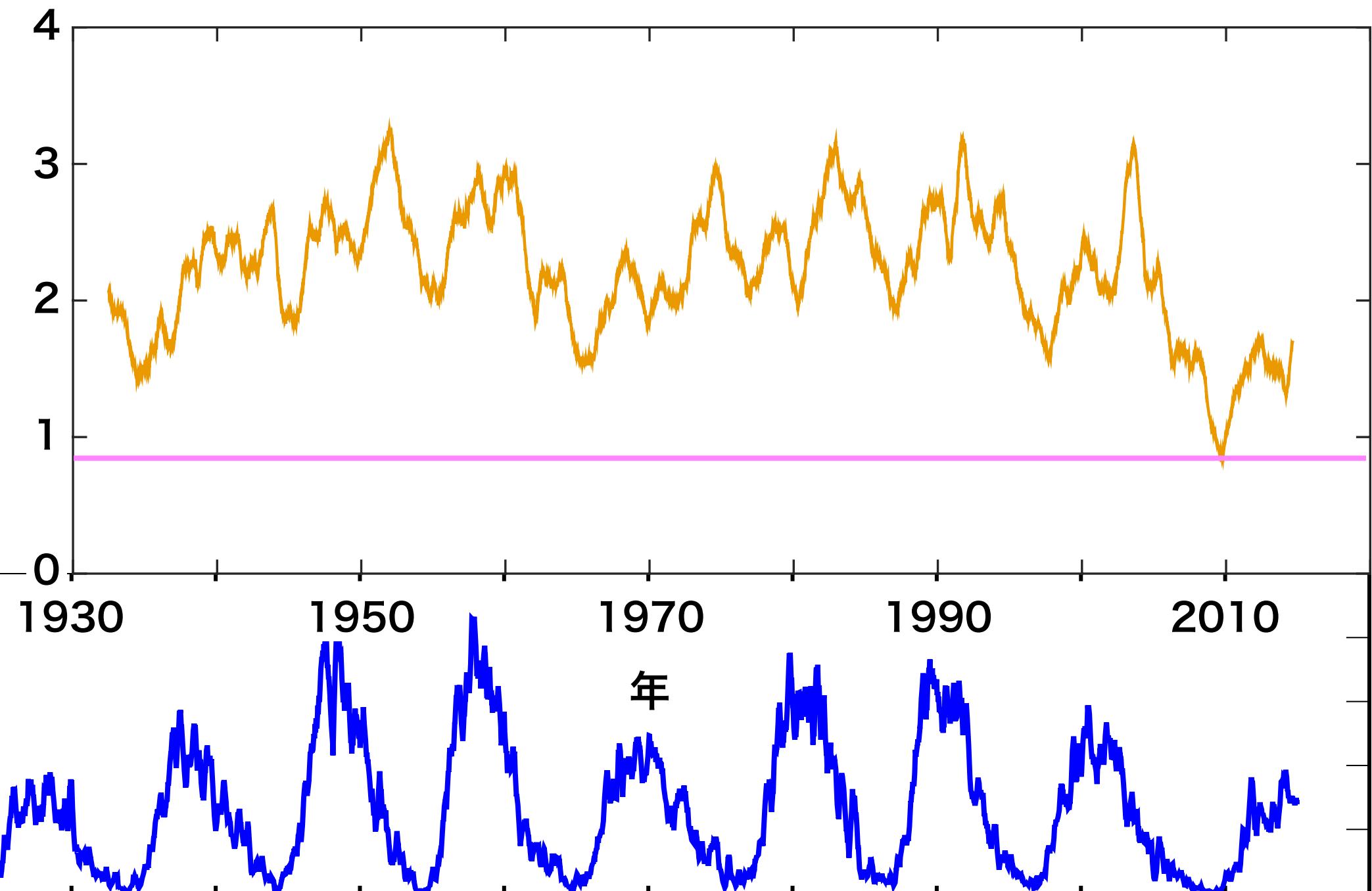
Yearly average of Kp index



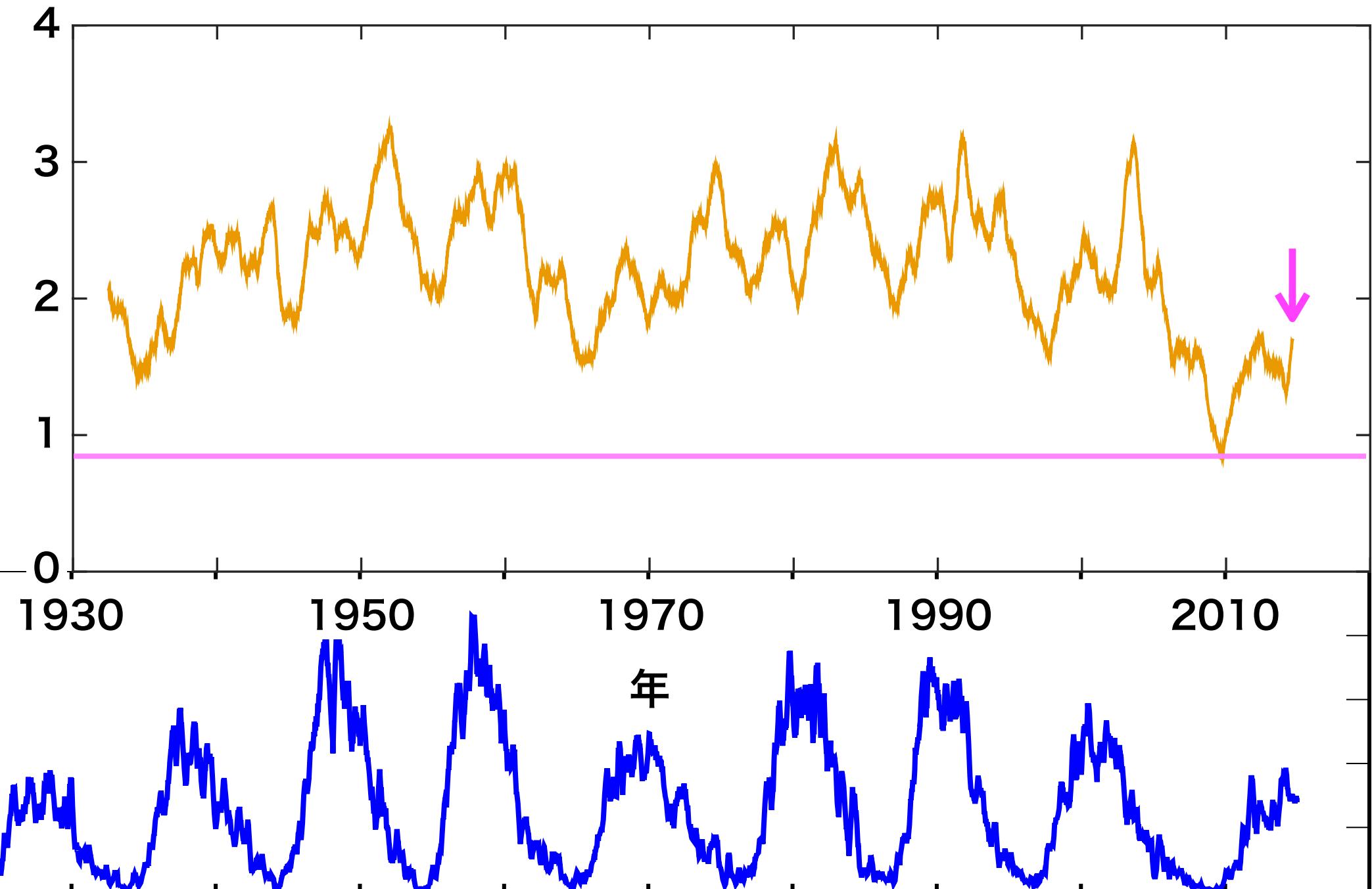
Yearly average of Kp index



Yearly average of Kp index



Yearly average of Kp index



Yearly average of Kp index

