

The Current Solar Minimum

Ken Tapping, 2008-04-17

This note summarizes my current feeling about the state of solar activity and the solar activity cycle. Any conclusions currently in circulation that have been drawn by extrapolating what you see in this note should not be regarded as reflecting my views. My conclusions are in this note. The information used here is freely available and readers are strongly encouraged to get the data, look at it and draw their own conclusions.

The current solar activity is not that unusual. At this point it is completely unjustified to see current solar behaviour as an indication of any departure from its what the Sun has been doing for at least the last 300 years.

Figure 1 shows a plot of solar activity as measured by the solar radio flux monitors operated by the National Research Council of Canada.

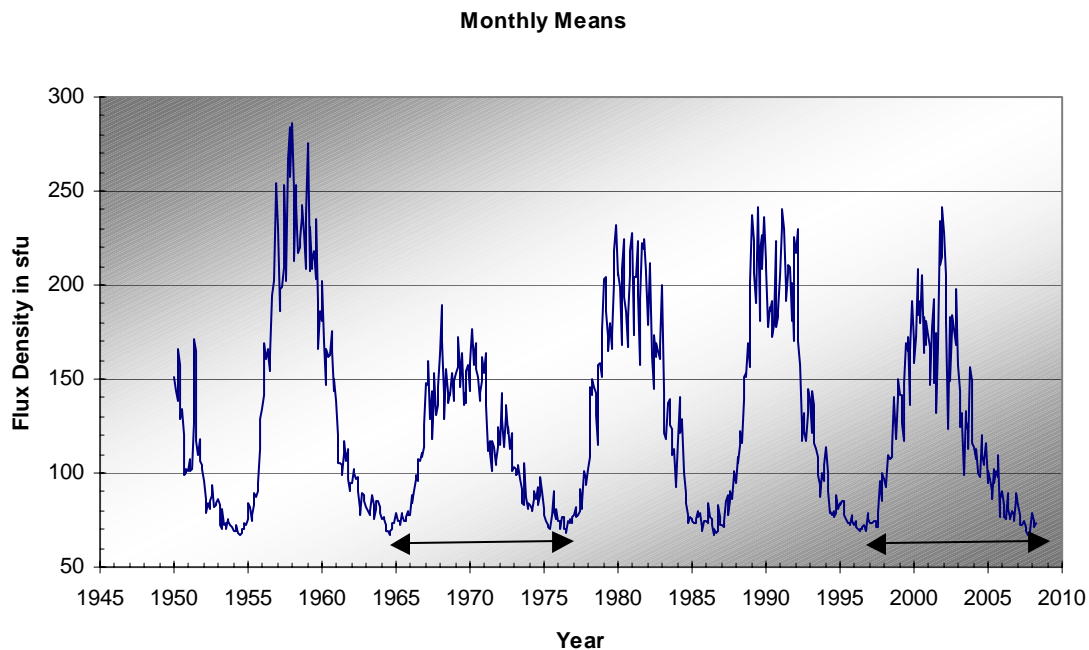


Figure 1: Monthly averaged 10.7 cm solar radio flux solar activity index since 1947 (monthly means).

The arrow under the 1964-1977 cycle indicates the length of that cycle, which was a little longer than the others. That same arrow has been copied and put under the last cycle. The length is unchanged. It can be seen that the current solar activity cycle (now ending) has not yet exceeded the length of the 1964-77 cycle. It is also clear that the longish cycle in 1964-77 was followed by further activity cycles - normal solar behaviour. To exceed the duration of the 1964-1977 cycle, the new cycle would have to delay its start at least well into 2009.

Figure 2 shows the 1964-77 and the 1997-? cycles overlaid on the same plot. Once again we can see the last cycle has yet to last longer than the 1964-77 cycle.

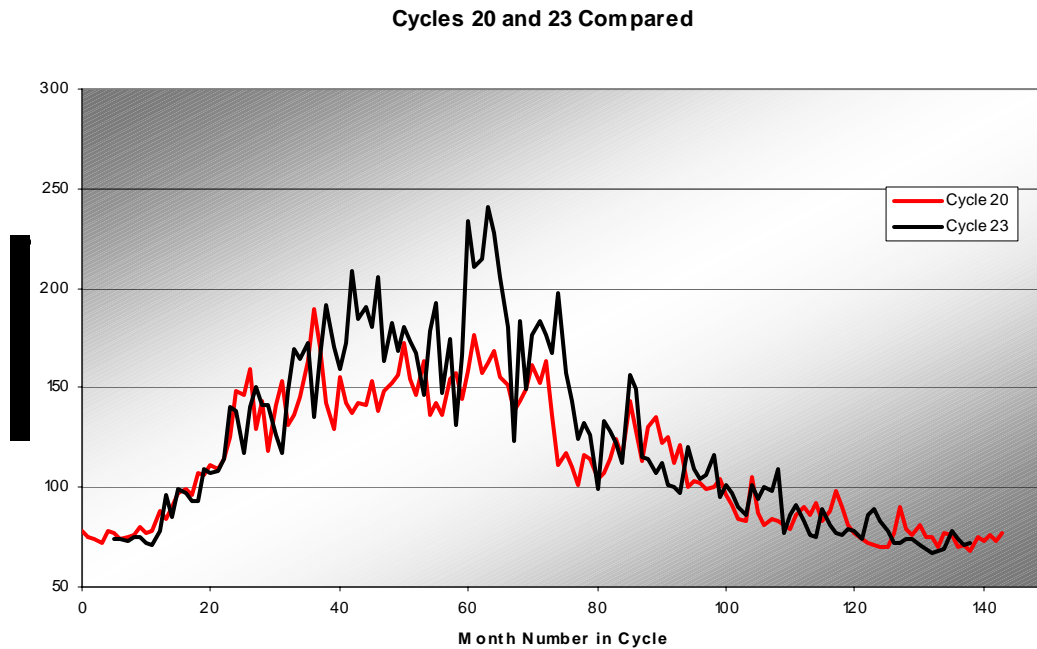


Figure 2: The 1964-77 cycles compared. The current cycle (black trace) has yet to last longer than the 1964-77 cycle (red trace).

The 10.7 cm solar flux covers only about six solar activity cycles. Sunspot number data covers at least 300 years. The histogram Figure 3 shows how the durations of the cycles as seen in the sunspot data have varied since 1700. A 13-year activity cycle is not that unusual.

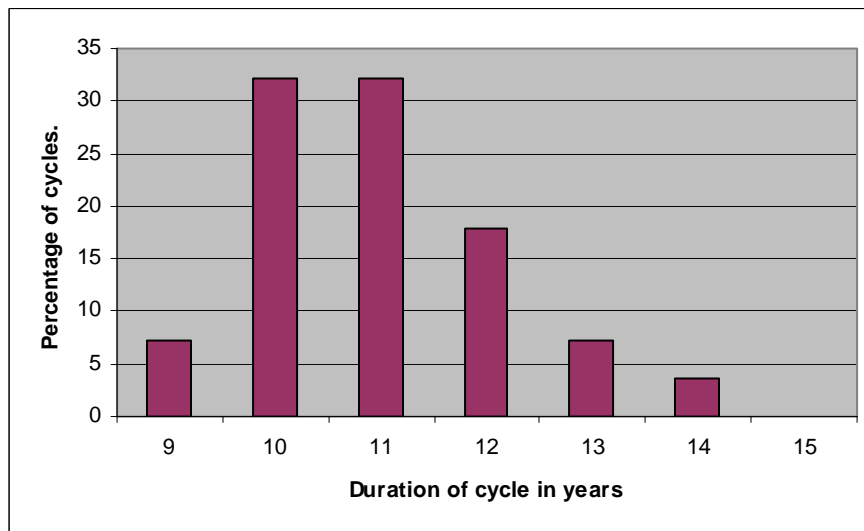


Figure 3: Distribution of solar cycle durations over the last 300 years. The 1964-1977 cycle, having a duration of 13 years is unusual, but not that unusual.

CONCLUSION: AT THE MOMENT IT IS UNJUSTIFIED TO ASSUME THE SUN IS UNDERGOING A SIGNIFICANT CHANGE IN BEHAVIOUR. ON THE BASIS OF SUNSPOT NUMBER DATA, WE CANNOT ASSUME ANYTHING ODD IS HAPPENING UNLESS THE NEXT CYCLE DELAYS ITS START INTO 2009 OR 2010.